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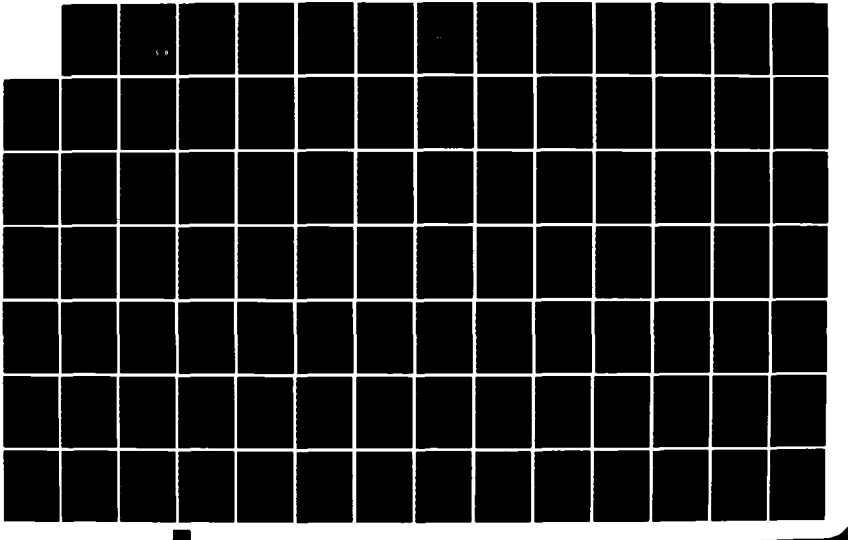

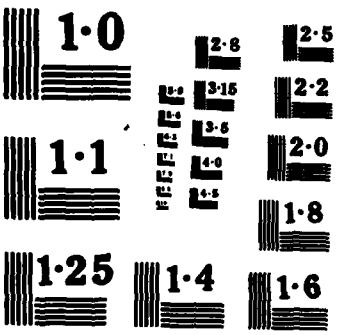
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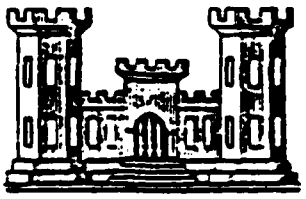
HOUSATONIC RIVER BASIN
HINSDALE, MASSACHUSETTS

UPPER SACKETT RESERVOIR DAM
MA 00227

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION, CORPS OF ENGINEERS

WALTHAM, MASS. 02154

AUGUST 1981

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER: MA 00227	2. GOVT ACCESSION NO. A154 482 — 3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle): Upper Sackett Reservoir Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS	5. TYPE OF REPORT & PERIOD COVERED: INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254	12. REPORT DATE: August 1981 13. NUMBER OF PAGES: 45
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report): UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,
Housatonic River Basin
Hinsdale, Massachusetts
Sackett Brook

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The dam is a 75.5 high, 660 ft. long earth embankment dam with a concrete corewall, a gate structure and an ungated concrete 60 foot long spillway weir. The dam has a size classification of intermediate and a hazard potential of high. The visual inspection indicated the dam to be in fair condition. Seepage was observed at three locations along the downstream toe of the dam. It is recommended that the owner engage a qualified engineer to investigate various remedial measures.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:
NEDED

SEP 11 1981

Honorable Edward J. King
Governor of the Commonwealth of
Massachusetts
State House
Boston, Massachusetts 02133

Dear Governor King:

Inclosed is a copy of the Upper Sackett Reservoir Dam (MA-00227) Phase I Inspection Report, prepared under the National Program for Inspection of Non-Federal Dams. This report is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. I approve the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is vitally important.

Copies of this report have been forwarded to the Department of Environmental Quality Engineering, and to the owner, City of Pittsfield. Copies will be available to the public in thirty days.

I wish to thank you and the Department of Environmental Quality Engineering for your cooperation in this program.

Sincerely,

C. E. EDGAR, III
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
BRIEF ASSESSMENT

IDENFIFICATION:	MA 00227
NAME OF DAM:	Upper Sackett Reservoir Dam
TOWN:	Hinsdale
COUNTY AND STATE:	Berkshire County, Massachusetts
STREAM:	Sackett Brook
DATE OF INSPECTION:	July 1, 1981

The dam is a 75.5 high, 660 feet long earth embankment dam with a concrete corewall, a gate structure and an ungated concrete 60 foot long spillway weir. The gate structure regulates a 12 inch water supply line and a 24 inch drain. The dam is Owned by the City of Pittsfield and maintained and operated by the Pittsfield Water Department. It was constructed in 1947.

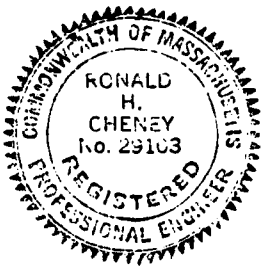
The dam has a size classification of intermediate and a hazard potential classification of high. Based upon Corps Guidelines, the PMF test flood inflow would be 3000 cfs, from the 1.0 square mile drainage area. The routed test flood discharge is 2645 cfs at a corresponding surcharge elevation of 1525.3. The top of dam, elevation 1526, would not be overtopped. The spillway has a capacity of 3350 cfs at the top of dam. The spillway can pass 127 percent of the test flood outflow.

The visual inspection indicated the dam to be in fair condition. Seepage was observed at three locations along the downstream toe of dam. Subsidence was observed near the gate structure and right spillway training wall. Trees with diameters up to 14 inches were observed along the downstream toe.

It is recommended that the Owner engage a qualified registered professional engineer to investigate and design required remedial measures for: the source of seepage at the downstream toe; the crest subsidence near the right spillway wall and gate structure; the cause of surficial sloughs on the downstream slope; a means of removing and backfilling trees and roots; evaluating the condition of the 24 inch drain to assure the gate is operable and repair of the leak in the spillway weir.

Furthermore, the Owner should institute remedial measures which include: removal of brush growth on the slopes; cutting of all trees near the training walls; cutting of brush and trees in the outlet channels; repair of the expansion joints and the spalled concrete at the training walls; yearly operation of all gates to insure continued adequacy; development of a formal surveillance and warning system and instituting a program of annual technical inspection.

The recommendations and remedial measures should be implemented by the Owner within one year after receipt of this Phase I Inspection Report.



Ronald H. Cheney

Ronald H. Cheney, P.E.
Vice President

Hayden, Harding & Buchanan, Inc.
Boston, Massachusetts

This Phase I Inspection Report on Upper Sackett Reservoir Dam (MA00227) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

ARAMAST MAHTESIAN, MEMBER
Geotechmical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation, however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the

condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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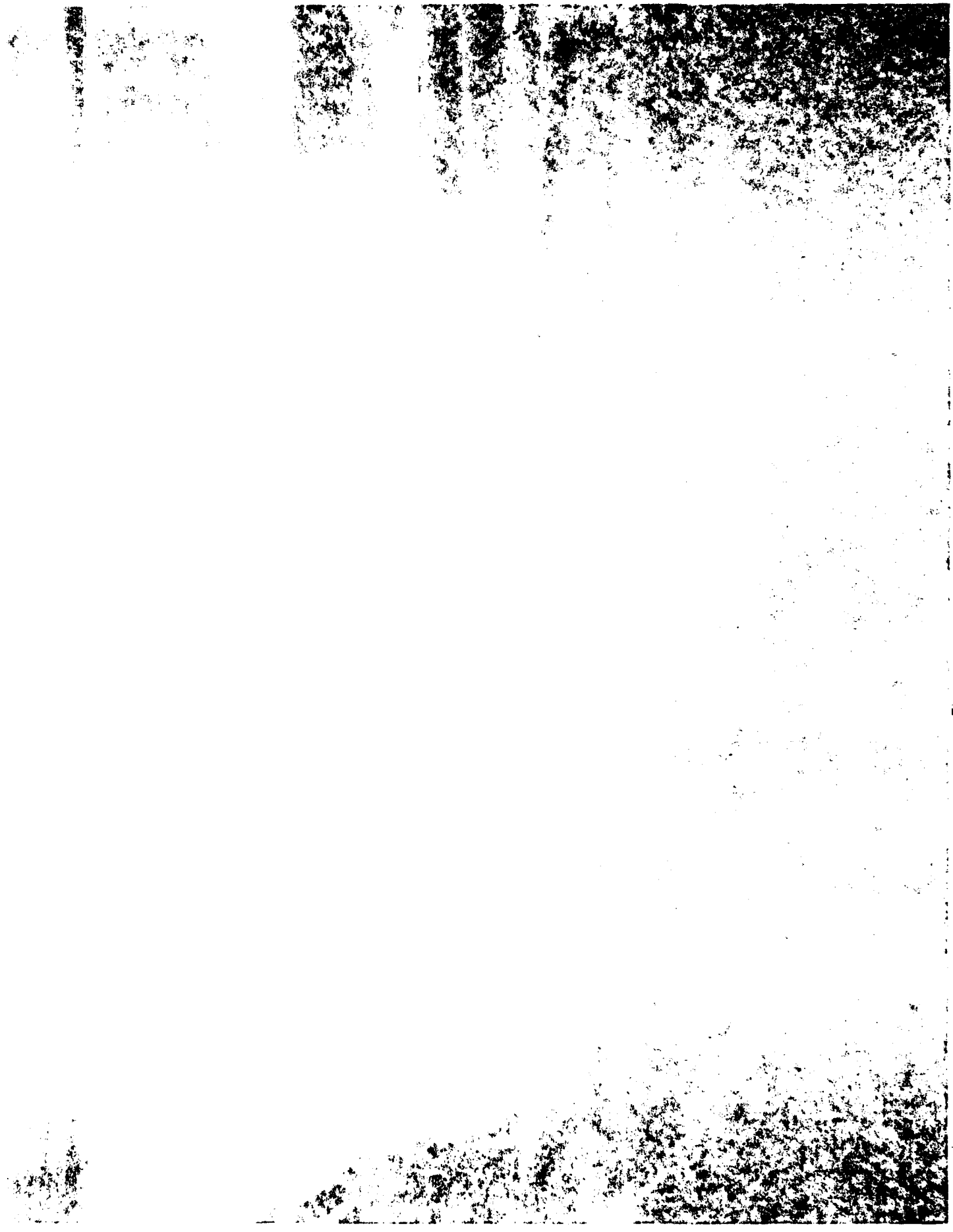
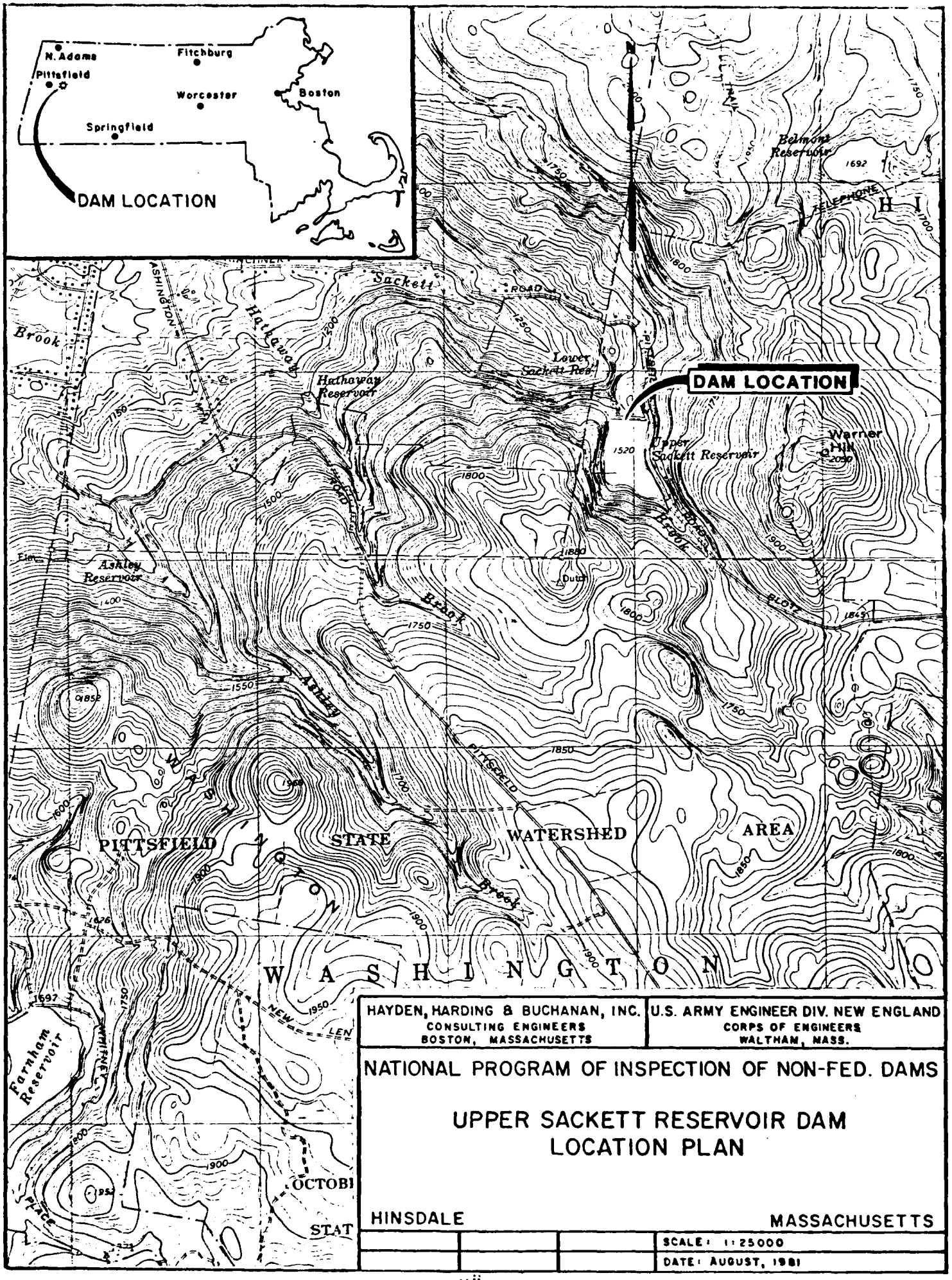




HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

UPPER SACKETT RESERVOIR DAM
LOCATION PLAN

HINSDALE MASSACHUSETTS

SCALE: 1:25000

DATE: AUGUST, 1981

PHASE I
NATIONAL DAM INSPECTION PROGRAM

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Hayden, Harding & Buchanan, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued to Hayden, Harding & Buchanan, Inc. on 26 June 1981 by William E. Hodgson Jr., Colonel, Corps of Engineers. Contract No. DACW 33-80-C-0006 has been assigned by the Corps of Engineers for this work.

b. Purpose

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and assist the States to initiate quickly, effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

Upper Sackett Reservoir Dam is located in the Town of Hinsdale, Berkshire County, Massachusetts. The dam impounds the waters of Sackett Brook. Upper Sackett Reservoir Dam is shown on the Pittsfield East, Massachusetts Quadrangle with the approximate coordinates of North 42° 25' 07", West 73° 09' 54". Sackett Brook flows into the Housatonic River about 4 miles downstream of the dam.

b. Description of Dam and Appurtenances

The structure is a 75.5 foot high, 660 foot long earth embankment dam with a concrete corewall, a gate structure and a concrete spillway. The spillway crest is 60 feet long, has concrete training walls and has no provisions for stoplogs or flashboards. The elevation of the top of spillway weir is 1520, six feet below the elevation of the crest of dam. See photographs 2 and 3 Appendix C and plan B-3 in Appendix B.

The dam embankment is an earth fill structure with a 16 foot wide crest. It contains a concrete corewall varying in width from 1 to 2 feet. The corewall comes to within 2 vertical feet of the top of crest. The upstream face is ripraped to the crest and has a slope of 2.5H:1V to elevation 1500 and 2H:1V above elevation 1500. The downstream face is turf lined and contains a 6 foot wide berm with a paved gutter at elevation 1500

which divides the downstream face into two sections. The upper section has a 2H:1V. slope and the lower section has a 2.5H:1V. slope. There is a rock toe section at the upstream and downstream toe and an unclassified earth berm at the upstream toe (See plans B-4 in Appendix B).

The gate structure is a 16 foot inside diameter, brick walled structure with a concrete beam and slab roof and concrete substructure. The gate structure contains the manually controlled gates. The inlet pipes at the gate structure include a 12 inch cast iron pipe from an intake structure approximately 95 feet upstream and a 24 inch cast iron main drain pipe which has an intake structure about 150 feet upstream, on a 45 degree angle with the dam (see plan B-3).

The outlet pipes from the gate structure include a 24 inch cast iron main drain which discharges approximately 240 feet from the gate structure and a 12 inch cast iron water supply line which joins the City's water supply system just downstream of Ashley Reservoir located approximately a mile and three quarters west. The gate structure also contains screen baskets. See Section 1.3.b and 1.3.j for a further description of the outlet works.

c. Size Classification

The dam size classification is intermediate, based on its hydraulic height of 75.5 feet. Corps Guideline requirements for an intermediate classification are a height of 40 to 100 feet and/or a storage capacity of 1,000 to 50,000 acre-feet. The dam has a storage capacity of 605 acre-feet.

d. Hazard Classification

The dam has a high hazard potential due to the potential for the loss of more than a few lives from an assumed dam failure flood. It is estimated that due to an assumed dam failure with water at the top of dam, at least 30 homes could be damaged by floodwater from 2 to 6 feet deep above first floor level.

Just prior to dam failure, spillway discharge could cause damage at roads and 26 homes. Floodwater depths could be at least 1 foot deep.

e. Ownership

The dam has been owned by the City of Pittsfield since it was constructed.

f. Operator

The dam is maintained by the City of Pittsfield Water Department. Mr. Paul J. Pierce is the superintendent. The address of the Water Department Office is Tyler Street, Pittsfield, Massachusetts, 01201. The telephone is (413) 443-6112.

g. Purpose of Dam

The purpose of the dam is water supply.

h. Design and Construction History

The dam was designed by Metcalf and Eddy of Boston, Massachusetts in 1946. The dam was constructed by Daniel O'Connell's Sons Inc. in 1947. No records of subsequent repairs or modifications to the dam are known to have been made.

i. Normal Operational Procedures

The dam is a water supply facility. The spillway has no provisions for flashboards. The 24 inch drain line is normally closed. The 12 inch water supply line is regulated according to the water demand of the system.

1.3 Pertinent Data

a. Drainage Area

The drainage area of 1.0 s.m. (640 acres), is wooded, rolling, undeveloped land within the Pittsfield State Watershed Area. The only major drainage path within the area is Sackett Brook which inlets into the reservoir at the southeast corner. See the drainage area map in Appendix D and photograph 1 in Appendix C. Ground surface elevations within the drainage area vary from elevation 1520, (spillway level) to a maximum of elevation 2050. The only roadway within the drainage area is Pittsfield Road which parallels the path of Sackett Brook over its final 2000 feet length before entering the reservoir.

b. Discharge at Dam Site

1. Outlet Works

The outlet works for the dam consist of an ungated spillway and channel, a 24 inch main drain and a 12 inch water supply line. The 12 inch water supply line has its inlet at elevation 1481.5. It exits the gate structure at invert elevation 1475.5. The line extends approximately 1-3/4 miles downstream where it joins the water supply system at Ashley Reservoir.

The 24 inch main drain has its invert at elevation 1474. It discharges at a concrete headwall structure (invert 1450.5) located at the downstream toe.

The gates for both pipes, located within the gate structure are operable according to Water Department personnel. However, the 24 inch gate has not been used in 5 to 6 years.

The maximum capacity of the 24 inch pipe is 5 cfs and the capacity of the 12 inch line is 1 cfs, with the water level at elevation 1526, top of dam.

The spillway, (see photographs 3 and 12), has concrete training walls, a 60 foot long concrete weir and has no provisions for stoplogs or flashboards. The elevation of the top of weir is 1520.

2. Maximum Known Flood

Records of maximum past floods or reservoir impoundments were not located. Data from the U.S. Weather Bureau indicate that 4 to 6 inches of rainfall occured in the vicinity of the dam during the periods of August 11 to 15 and again on August 17 to 20, 1955.

3. Ungated Spillway Capacity at Top of Dam

The spillway capacity is 3350 cfs with the reservoir water level at the top of dam, elevation 1526. All gate valves were assumed closed.

4. Ungated Spillway Capacity at Test Flood

The routed test flood outflow would be 2645 cfs. The spillway has a capacity of 3350 cfs or 127 percent of

the test flood outflow. The test flood surcharge elevation would be 1525.3. All gate valves were assumed closed.

5. Total Project Discharge at Top of Dam

The total project discharge with the reservoir level at the top of dam, elevation 1526, and with the 12 and 24 inch outlet pipes open would be about 3355 cfs.

6. Total Project Discharge at Test Flood Elevation

The total project discharge for the test flood condition with the 24 and 12 inch outlet pipes open would be approximately 2650 cfs, at elevation 1525.3.

c. Elevation (feet above NGVD - approximate only)

(1)	Streambed at toe of dam	1450±
(2)	Bottom of cutoff	1460
(3)	Maximum tailwater	Unknown
(4)	Normal pool	1520
(5)	Full flood control pool	N/A
(6)	Spillway crest	1520
(7)	Design surcharge (Original Design)	1523.5
(8)	Top of Dam	1526
(9)	Test flood surcharge	1525.3

d. Reservoir (Length in feet)

(1)	Normal pool (elevation 1520)	1400
(2)	Spillway crest pool	1400
(3)	Top of dam	1450
(4)	Test flood pool	1450
(5)	Flood control pool	N/A

e. Storage (acre-feet)

(1)	Normal pool (elevation 1520)	475
(2)	Spillway crest pool	475
(3)	Test flood pool	590
(4)	Top of dam	605
(5)	Flood control pool	N/A

f. Reservoir Surfaces (acres)

(1)	Normal pool	20.4
(2)	Spillway crest (elevation 1520)	20.4
(3)	Test flood pool	22.2
(4)	Top of dam	22.4
(5)	Flood control pool	N/A

g. Dam

(1)	Type	*earth embankment*
(2)	Length	660'
(3)	Height (hydraulic)	75.5'
(4)	Top Width	16'
(5)	Side Slopes - Upper	2H:1V
	- Lower	2.5H:1V
(6)	Zoning	impervious earth and bank run gravel
(7)	Impervious Core	impervious earth and concrete core wall
(8)	Cutoff	concrete core wall
(9)	Grout curtain	None

h. Diversion and Regulating Tunnel - None at this project

i. Spillway

(1)	Type	ogee weir
(2)	Length of weir	60'

(3) Crest elevation(top of concrete weir) --- 1520

(4) Gates or provisions for flashboards ----- None

(5) U/S Channel ---------- 60'± wide

(6) D/S Channel ---------- 25'± wide

j. Regulating Outlet

Discharge from the 12 inch water line and 24 inch drain pipe are regulated at the 16 foot diameter brick gate structure. The gate structure contains a well which extends to elevation 1473. There are 5 manually operated gate valves within the gate structure. These consist of a 12 inch water supply inlet (invert elevation 1481.5), a 24 inch drain inlet (invert elevation 1474), a 24 inch drain outlet (invert elevation 1474), a 12 inch water supply outlet (invert elevation 1475.5) and a gate valve controlling flow into the 24 inch line from the gate structure well. See plan B-5 in Appendix B. By regulating the valves water can be drawn from high or low levels from within the reservoir and discharged into the water supply line or drain line.

SECTION 2

ENGINEERING DATA

2.1 Design Data

Design plans, dated August 1946, prepared by Metcalf and Eddy, Inc., Boston, Massachusetts, were obtained from the Pittsfield Engineering Department.

Design calculations were located at the office of Metcalf and Eddy, Boston, Massachusetts.

2.2 Construction Data

The report titled "Final Report on the Construction of Sackett Brook Upper Dam and Appurtenances, March 15, 1949, 2044" prepared by Metcalf and Eddy was made available at their Boston office.

2.3 Operation Data

Operational data is available at the Water Department and Engineering Department.

2.4 Evaluation of Data

a. Availability

Design plans by Metcalf and Eddy, Inc. were obtained from the Pittsfield Engineering Department. Design calculations were located at the office of Metcalf and Eddy. State Inspection Reports from the years 1971, 1972, 1974 and 1977 and a 1966

County Inspection Report were made available at the Department of Environmental Quality Engineering, Division of Waterways, Boston Office.

b. Adequacy

The information made available, along with the visual inspection, is adequate for a Phase I level inspection.

c. Validity

The visual inspection of this facility showed no reason to question the validity of the information supplied within the March 15, 1949 Final Report, the State Inspection Reports or the August 1946 Metcalf and Eddy plans and calculations.

SECTION 3

VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection performed on July 1, 1981, included the dam, the spillway and the gate structure. The water level of the reservoir was about 10 inches below the spillway crest at the time of the inspection.

b. Dam

The dam is an earth fill structure about 75.5 feet high, 660 feet long and 16 feet wide at the crest. The as-built drawings contained in the 1949 Metcalf & Eddy Final Report, indicate that the embankment is composed primarily of impervious earth and contains a reinforced concrete corewall, upstream riprap cover, a rock toe at both the upstream and downstream toe, an unclassified earth berm at the upstream toe and a bank-run gravel drainage zone in the downstream embankment.

A spillway is located between the left side of the dam and the left abutment.

1. Upstream Slope

The upstream slope of the dam is inclined at 2H:1V above elevation 1500 and 2.5H:1V below elevation 1500.

The riprap above the waterline is in good condition with no slope failures evident (photograph 4). However, at the gate structure there is some evidence that

the upstream slope may have subsided somewhat, as shown in photograph 11. It appears that the foundation wall of the gate structure was resurfaced with mortar in the past and that the riprap has settled as much as 10 inches below the area that was resurfaced.

Brush up to 5 feet tall is present on the upstream slope.

2. Crest

The dam crest, shown in photograph 10 is grass covered with no apparent misalignment. At the left end of the dam, the crest has settled about 1 foot immediately behind the right wall of the spillway as shown in photograph 12.

3. Downstream Slope

The downstream slope of the dam, shown in photograph 5, has an upper slope of 2H:1V and a lower slope of 2.5H:1V. These sections of the slope are separated by a 6 foot wide terrace at elevation 1500. The slope is grass covered and generally well maintained except near the toe where trees, up to 14 inch diameter, are growing.

Seepage of 1 to 2 gpm of clear water was observed at the intersection of the toe of the dam and the right abutment at a location about 100 feet from the right end of the dam (photograph 9).

Two other areas of seepage were observed a few feet to the left side of the outlet structure flowing out of the rockfill toe. The largest seepage area, shown in

photograph 7, was flowing at an estimated rate of 3 to 5 gpm from an elevation of a couple of feet higher than the flow in the outlet channel. A smaller seepage area flowing at an estimated rate of 1 gpm was observed a few feet above this seepage area. The flow in both areas appeared clear at the time of the inspection.

Several small sloughs up to 1.5 feet deep were observed on the downstream slope at an elevation midway between the crest and the terrace in the general area below the gate structure.

c. Appurtenant Structures

Heavy tree growth is evident on the left abutment immediately behind the left training wall of the spillway as shown in photograph 2. Heavy brush and small trees are present near the downstream end of the right spillway training wall.

The downstream concrete spillway apron is in good condition except for vegetation growing in the joints (photograph 3).

The spillway weir was observed to be in generally good condition. Due to the low water level during the July 8, 1981 inspection, no leakage was observed through the weir, however, at the time the aerial photograph was taken the water level was higher and leakage can be observed at the expansion joint. There is some minor efflorescence observed at the left training wall at the weir.

The training walls are in generally good condition. There is a small piece of concrete missing at the top of the

right intake training wall at the expansion joint with the spillway weir. There is some spalling at expansion joints and the joints are in need of filling and caulking. There is some minor spalling of concrete at the wall tops.

According to Pittsfield Water Department personnel, the gates for the 12 and 24 inch pipes are operational. The 12 inch pipe is operated frequently, however the 24 inch drain pipe has not been operated for about 5 or 6 years. The 24 inch pipe was reported to be closed however, water, estimated at 2 gallons per minute was observed discharging from the pipe outlet.

The outlet structure is a 4 foot high by 4 foot wide concrete headwall structure with training walls inclined at approximately 1 1/2H:1V (photograph 8). The outlet structure was in generally good condition.

d. Reservoir Area

There is no indication of slope instability along the banks of the reservoir in the vicinity of the dam.

e. Downstream Channel

The spillway discharge channel is a steeply sloped channel cut in bedrock. The channel is generally free of obstructions but has numerous trees overhanging the channel as shown in photograph 2.

The main drain outlet channel is the natural streambed. This channel has become overgrown with brush and trees both in and overhanging the channel (photograph 6).

3.2 Evaluation

Visual inspection indicates that the dam is in generally fair condition. The inspection disclosed the following items which require attention:

a. The seepage observed at three locations along the toe of the dam, if left uncontrolled, could lead to piping and stability problems for the dam.

b. The subsidence near the gate structure and right spillway training wall may be indicative of erosion or piping of soil in these areas.

c. Roots of trees at the toe of the dam could provide pathways for seepage which could lead to internal erosion of the embankment. Uprooting of trees during a storm could cause local instability and sloughing at the toe of the embankment.

d. The 24 inch drain line has not been operated for 5 or 6 years. The condition of the gate and source of existing discharge should be determined.

e. Several small sloughs were observed on the downstream slope.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General

The dam is a water supply facility containing a spillway which has no provisions for flashboards. The 24 inch drain line is normally closed and the 12 inch water supply line is regulated according to the demand of the system.

b. Description of Warning System

There are no warning systems at this dam.

4.2 Maintenance Procedures

a. General

The Pittsfield Water Department is responsible for the maintenance of this dam. The dam and its associated appurtenances are checked by employees of the Water Department, on a weekly basis.

b. Operating Facilities

There is no formal maintenance procedure for this facility. As the dam is used for water supply purposes, any deficiencies in the operational facilities could be detected during normal operation.

4.3 Evaluation

There are no formal written operational or maintenance procedures. The Pittsfield Water Department periodically checks the facility and performs general maintenance. A program of annual technical inspection should be instituted. A formal downstream warning system should be developed and put into effect.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

Upper Sackett Reservoir is located in the southwest corner of the Town of Hinsdale, about 1.75 miles east of the City of Pittsfield. The drainage area, 1.0 s.m (640 acres), is wooded, undeveloped land within the Pittsfield State Watershed Area. The terrain is rolling and there is one brook which carries runoff to the reservoir.

The reservoir outlet, Sackett Brook, flows northwest about 4 miles to reach the Housatonic River, in Pittsfield.

5.2 Design Data

The dam was constructed in 1947. Design plans dated 1946 were found. Hydraulic/hydrologic design data was located and appear to follow acceptable engineering standards at the time of design.

5.3 Experience Data

Reservoir water surface level records and other operating information are available at the Pittsfield Water Department or Engineering Department Offices. The normal pool level of this reservoir varies considerably, depending on inflow and demand.

5.4 Test Flood Analysis

The dam has a size classification of intermediate and a high hazard potential. Based upon Corps Guidelines, the test flood would be the full PMF. The test flood inflow from the 1.0 s.m. drainage area is 3,000 cfs. This is based upon Corps Guidelines for runoff of 3000 cfs/s.m. from a drainage area of 1 s.m. in size. The routed outflow through the spillway would be 2,645 cfs. The spillway can pass 127 percent of the routed test flood outflow.

Assuming the reservoir was initially filled to the spillway level (photograph 12), elevation 1520.0, the inflow would surcharge the reservoir to elevation 1525.3±. Water would be about 5.3 feet deep at the spillway, whose maximum depth is 6 feet. The spillway has no provisions for flashboards. The dam is not overtopped under test flood conditions.

5.5 Dam Failure Analysis

This dam was determined to have a high hazard potential due to the potential loss of more than a few lives from an assumed dam failure flood. The dam was assumed to have failed when the water level was at elevation 1526.0, top of dam. The peak failure discharge of 167,660 cfs is developed by assuming a breach length of 152 feet for the 75.5 feet high structure. All downstream flood levels refer to depths above first floor level in homes.

The outlet channel, Sackett Brook, runs westerly about 4 miles to reach the Housatonic River. Three impact areas were

determined in this analysis. They occur at Kichner Road, Washington Mountain Road and Division Road.

At the first area, Kirchner Road, Station 50+00, the road is overtopped by up to 20± feet of floodwater. Two homes and a barn could be damaged by 2 to 3± feet of floodwater. A significant amount of floodwater could flow downhill along Kischner Road damaging other homes.

At the second impact area, Washington Mountain Road, Stations 80+00 to 90+00, the road will be overtopped by up to 14± feet of floodwater. At least 2 homes could be damaged by 2 to 5 feet of floodwater.

The third impact area occurs at Division Street, Stations 100+00 to 105+00. Here, the road will be overtopped by at least 6± feet of floodwater. In this developed area, at least 26 homes could be damaged by at least 2 to 6 feet of floodwater.

Beyond the areas studied, there could be additional floodwater damage as the remaining 25,000± cfs dam failure discharge flows to the Housatonic River. Significant flood depths could continue along the remaining 2± mile flow path.

Just prior to dam failure, spillway discharge would be about 3,350 cfs. This flow will cause downstream flooding problems at road crossings and homes built near the brook channel. Floodwater about 1 foot deep could damage the 25 homes near Division Road.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

The visual inspection indicates the following potential structural problem:

a. The presence of seepage at the downstream toe of the embankment, if left uncontrolled, could lead to failure of the dam.

b. Areas of erosion or seepage could be created by the uprooting or decaying of trees located at the toe of the embankment.

6.2 Design and Construction Data

Design drawings prepared by Metcalf & Eddy Engineers, Boston, Massachusetts dated August 1946 and the final report dated March 1949 were reviewed.

The following geotechnical information was obtained from these drawings.

a. The upstream and downstream slopes are 2H:1V above elevation 1500 and 2.5H:1V below elevation 1500.

b. The dam is an earth embankment with a concrete corewall extending the full length of the dam from 2 feet below the crest to the natural foundation soils. The upstream face is fully ripraped overlying a 12 inch gravel layer. Upstream of the corewall the embankment is classified as "impervious earth" which was compacted to an average dry unit weight of 121 pcf which

corresponds to an average of 95.6 percent of the "modified proctor test". This fill is described as a well-graded glacial till and was estimated to have a permeability of 0.1 x 10 -4 cm/sec. Downstream of the corewall, the embankment is the same "impervious earth" but includes a bank-run gravel drainage zone. A rock toe is included at both the upstream and downstream toe and an earth berm was constructed at the upstream toe.

c. The embankment is founded on the natural deposits located in the river bottom which are generally identified as very compact sand, gravel and boulders with trace of clay.

d. The natural foundation soils were stripped to firm material and covered with a thin layer of "most impervious material".

e. Filter-protected tile drains were provided under the spillway discharge channel and along the downstream toe of the dam east (right) of the brook channel.

6.3 Post Construction Changes

No significant post construction changes to the dam are known.

6.4 Seismic Stability

The dam is located within Seismic Zone 2 and in accordance with the recommended Phase I guidelines does not require seismic stability analysis.

SECTION 7

ASSESSMENT, RECOMMENDATIONS, REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

Based on a visual inspection and the available information the dam is judged to be in fair condition.

b. Adequacy of Information

The information made available, along with the visual inspection, is adequate for a Phase I level investigation.

c. Urgency

The recommendations and remedial measures presented below should be implemented within one year after receipt of the Phase I Inspection Report from the Owner.

7.2 Recommendations

The Owner should engage a qualified registered professional engineer to investigate and design the required remedial measures for:

a. The source of seepage found at three locations at the downstream toe of the dam.

b. The crest subsidence near the right spillway wall and the slope subsidence near the gate structure.

c. The cause of surficial sloughs on the downstream slope.

d. Means of removing tree and roots from the dam and 20 feet beyond the downstream toe and selecting acceptable backfill for holes created by root removal.

e. Evaluating the condition of the 24 inch drain line control gate to assure the gate is operable.

f. Repair of the leak in the spillway weir.

The Owner should implement the recommendations of the engineer.

7.3 Remedial Measures

a. Operating and Maintenance Procedures

1. Brush growth on the upstream and downstream slopes should be cut as part of routine annual maintenance.

2. All trees on the left abutment within 10 feet of the spillway training wall and trees near the end of the right spillway training wall should be cut.

3. Brush and trees in the spillway and outlet discharge channels should be cut for a distance of 50 feet downstream, as part of routine maintenance.

4. The expansion joints in the spillway training walls should be filled and caulked.

5. The spalled concrete at the top of the spillway training walls and the missing piece of concrete at the right training wall adjacent to the weir should be repaired.

6. All control gates should be operated yearly to insure continued adequacy.

7. The dam should be inspected every year by qualified registered professional engineers who can identify areas of concern which, if left unchecked, could jeopardize the safety of the dam. This inspection should include observation and documentation of seepage so that significant changes in flow can be detected. This inspection should be performed at both high and low reservoir level.

8. The Owner should develop a formal surveillance and warning system for downstream areas in case of emergency.

7.4 Alternatives

There are no practical alternatives for these recommendations and remedial measures.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Upper Sackett Reservoir Dam

DATE 7/1/81

TIME 11:00

WEATHER Partly sunny - 80's

W.S. ELEV. 1519± U.S. ____ DN.S.

PARTY:

1. Ron Cheney HHB
2. Dave Vine HHB
3. Mike Angieri HHB
4. Karl Dalenberg GEI
5. Ray Pulver Pittsfield Water Dept.
6. ____
7. ____
8. ____
9. ____
10. ____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Embankment	R.C., D.V., M.A., K.D	
2.	Spillway	R.C., D.V., M.A., K.D	
3.	Outlet Works	R.C., D.V., M.A., K.D	
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Dam Embankment NAME K. Dalenberg, D. Vine

DISCIPLINE Geotechnical, Structural & Hydraulic NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
DAM EMBANKMENT	
Crest Elevation	1526
Current Pool Elevation	1519±
Maximum Impoundment to Date	Unknown
Surface Cracks	None observed.
Pavement Condition	No pavement.
Movement or Settlement of Crest	Settlement of crest ≈ 1 ft at intersection with left spillway wall.
Lateral Movement	None observed.
Vertical Alignment	Good.
Horizontal Alignment	Good.
Condition at Abutment and at Concrete Structures	Settlement of crest ≈ 1 ft at spillway wall and at gate structure
Indications of Movement of Structural Items on Slopes	None observed
Trespassing on Slopes	None observed.
Sloughing or Erosion of Slopes or Abutments	Minor sloughing of downstream slope in several areas below gatehouse up to 1½ ft scarps on slope.
Rock Slope Protection - Riprap Failures	Riprap in good condition. No failures observed.
Unusual Movement or Cracking at or Near Toe	None observed.
Unusual Embankment or Downstream Seepage	1. Seepage of 1-2 gpm near intersection of toe and right abutment beginning about 100 ft from right end of dam.
Piping or Boils	2. Seepage of 3-5 gpm from riprap on left side of outlet structure at toe.
Foundation Drainage Features	None observed.
Toe Drains	None observed.
Instrumentation System	Rock toe observed along most of dam.
Vegetation	None observed.
	Minor brush on upstream slope. Trees up to 14-in diameter at toe of dam.

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Outlet Works NAME K. Dalenberg, D. Vine

DISCIPLINE Geotechnical, Structural & Hydraulic NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	
Slope Conditions	Below water at time of inspection.
Bottom Conditions	"
Rock Slides or Falls	"
Log Boom	"
Debris	"
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	Below water at time of inspection.
Condition of Concrete	
Stop Logs and Slots	

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Outlet Works NAME Karl Dalenberg, D. Vine

DISCIPLINE Geotechnical, Structural & Hydraulic NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	The brick walled with concrete beam and slab roof gate structure was in good condition
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	All gates are manual
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Outlet Works NAME K. Dalenberg, D. Vine

DISCIPLINE Geotechnical, Structural & Hydrauli NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	
General Condition of Concrete	None at this project.
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Outlet Works NAME K. Dalenberg, D. Vine

DISCIPLINE Geotechnical, Structural & Hydraulic NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Good
Rust or Staining	None Observed
Spalling	"
Erosion or Cavitation	"
Visible Reinforcing	"
Any Seepage or Efflorescence	"
Condition at Joints	Good
Drain holes	None observed.
Channel	Riprap bottom.
Loose Rock or Trees Overhanging Channel	Numerous trees overhanging and in channel.
Condition of Discharge Channel	Heavily overgrown.

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Outlet Works NAME K. Dalenberg, D. Vine

DISCIPLINE Geotechnical, Structural & Hydraulic NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Below water.
Loose Rock Overhanging Channel	None observed.
Trees Overhanging Channel	Heavy growth above left wall on abutment.
Floor of Approach Channel	Below water.
b. Weir and Training Walls	
General Condition of Concrete	Good
Rust or Staining	Minor
Spalling	Minor along top of walls
Any Visible Reinforcing	None
Any Seepage or Efflorescence	Minor
Drain Holes	None observed.
c. Discharge Channel	
General Condition	Concrete section is good.
Loose Rock Overhanging Channel	None observed.
Trees Overhanging Channel	Above left channel wall on abutment
Floor of Channel	Concrete section good-steeply dipping bedrock floor beyond concrete section - some tree growth on sides and in bottom.
Other Obstructions	
Other Comments	Vegetation in concrete joints.

PERIODIC INSPECTION CHECKLIST

PROJECT Upper Sackett Reservoir Dam DATE 7/1/81

PROJECT FEATURE Outlet Works NAME K. Dalenberg, D.Vine

DISCIPLINE Geotechnical, Structural & Hydraulic NAME R. Cheney, M. Angieri

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	None at this project.
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	
Underside of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

APPENDIX B

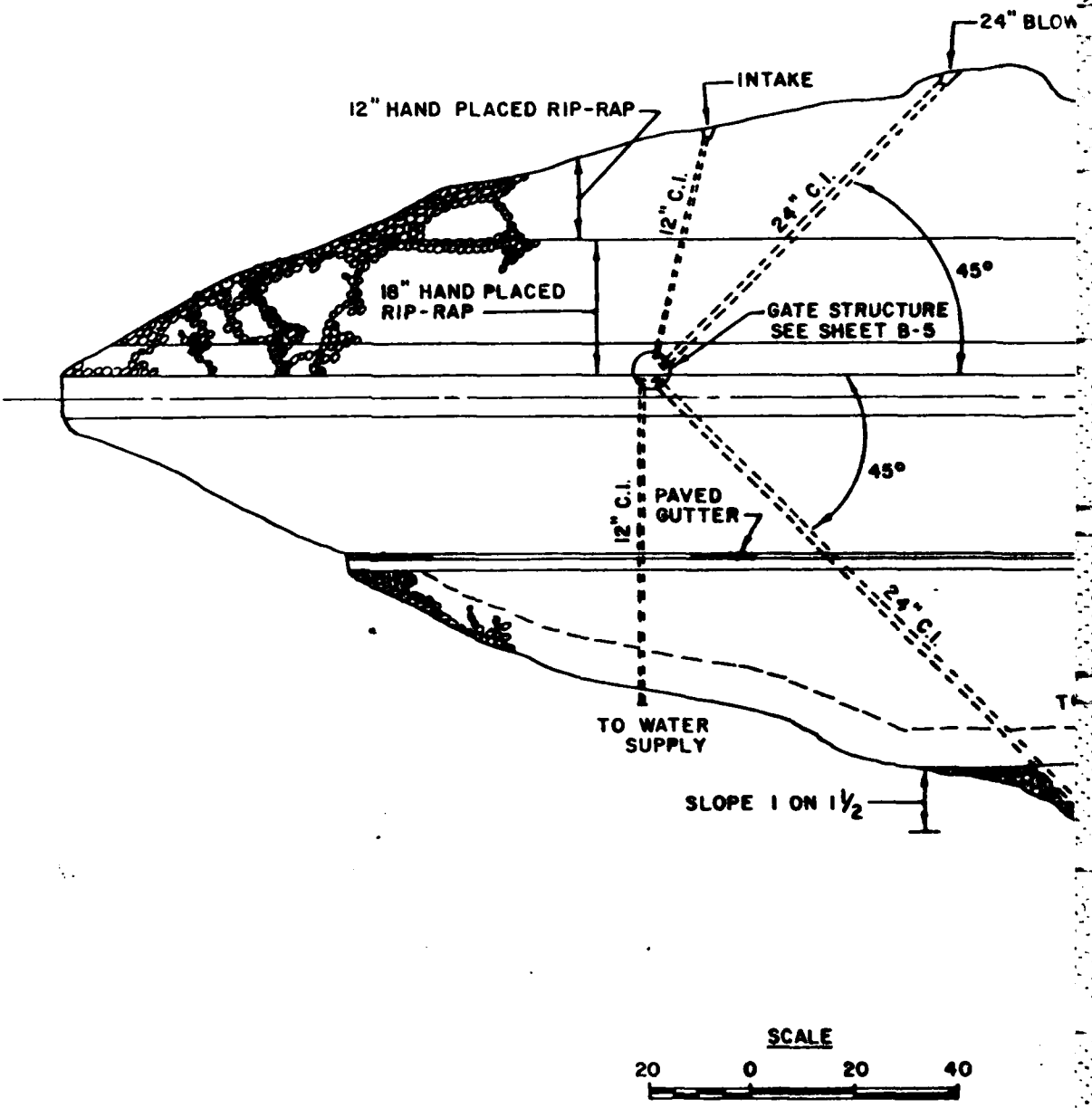
ENGINEERING DATA

LIST OF AVAILABLE ENGINEERING DATA

1. Design plans dated 1946, provided by Pittsfield Engineering Department.

2. Design calculations and Final Report, provided by Medcalf & Eddy, Boston, Massachusetts.

3. State Inspection Reports for the years 1971, 1972, 1974 and 1977 and County Inspection Report for 1966, provided by the Department of Environmental Quality Engineering, Division of Waterways, Boston Office.



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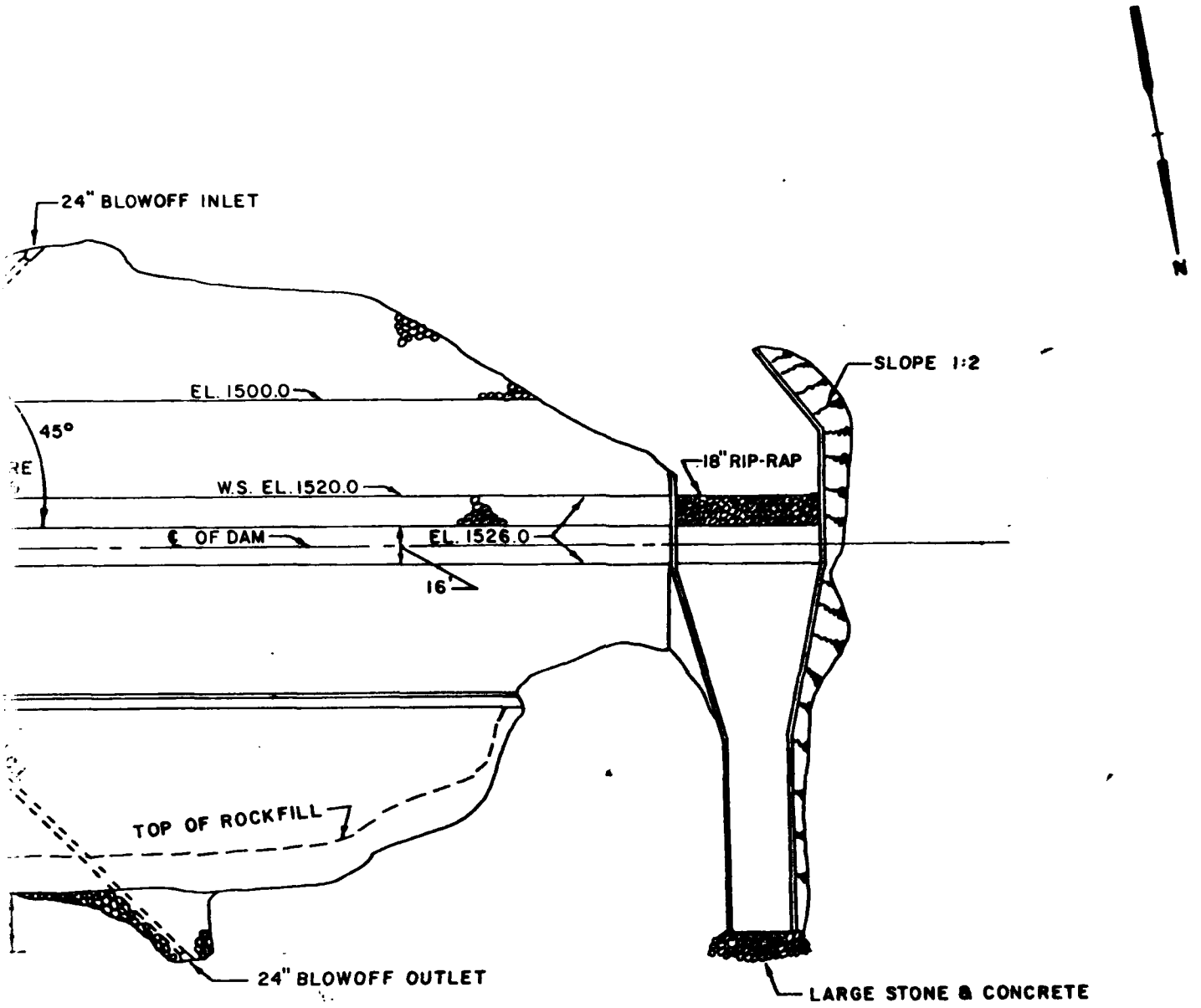

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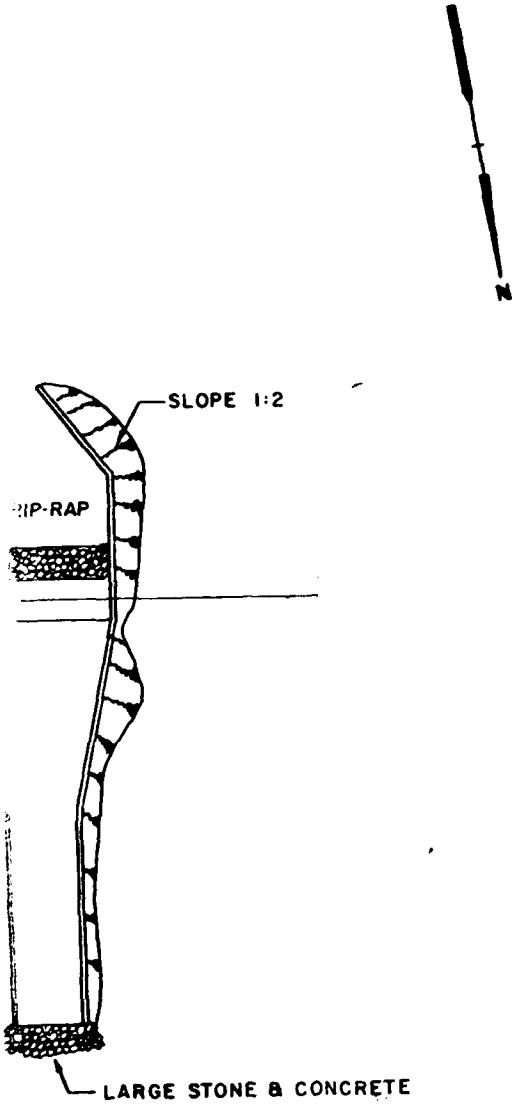

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UPPER SACKETT RESERVOIR DAM
PLAN

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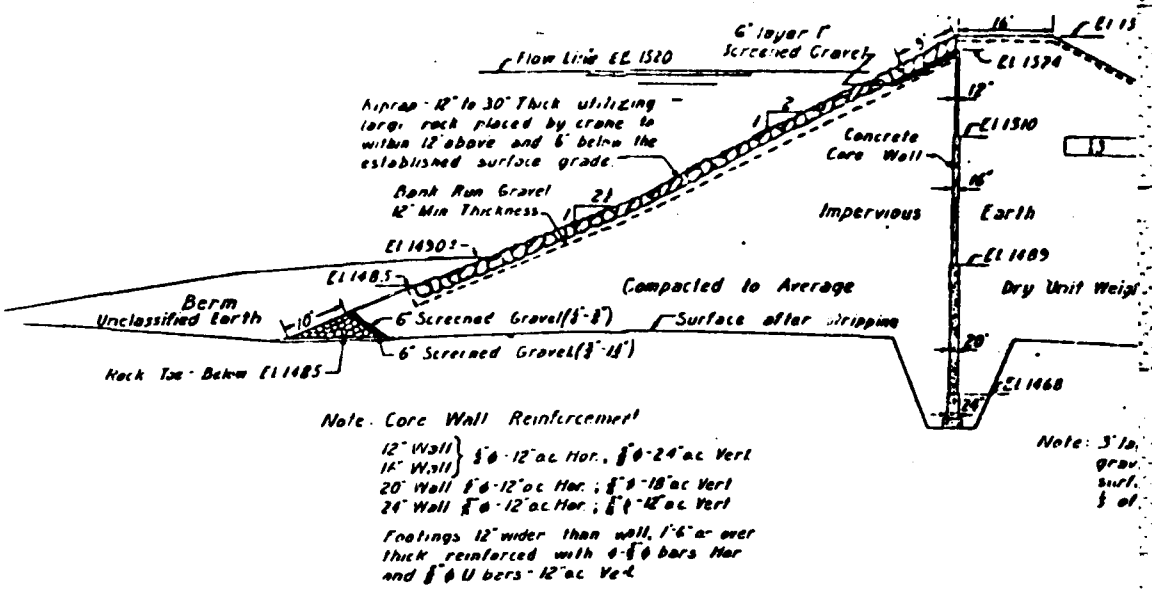

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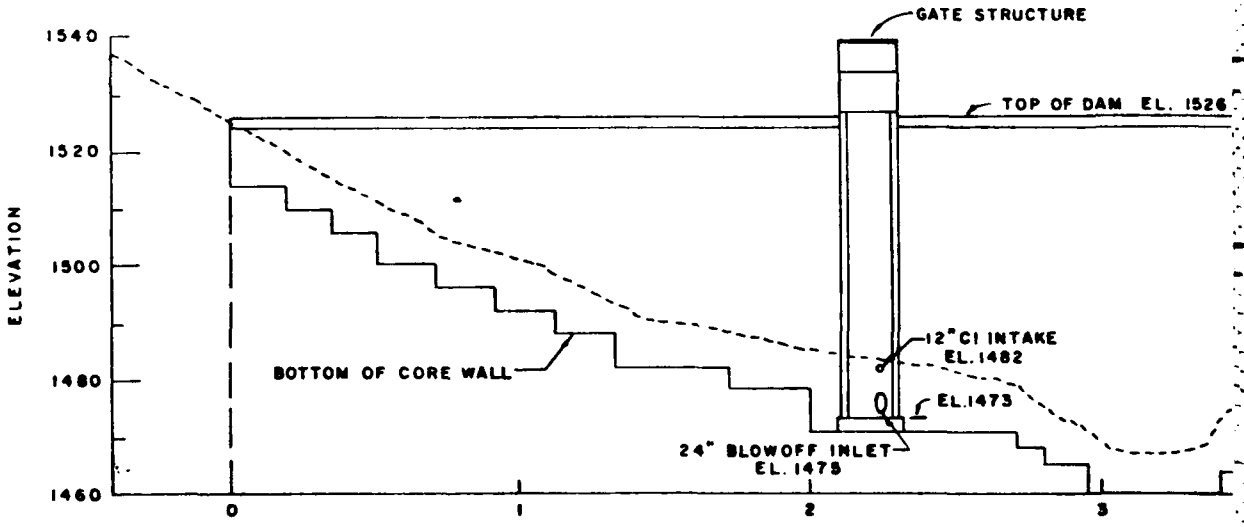

PROFILE ALONG CENTER

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HORIZONTAL

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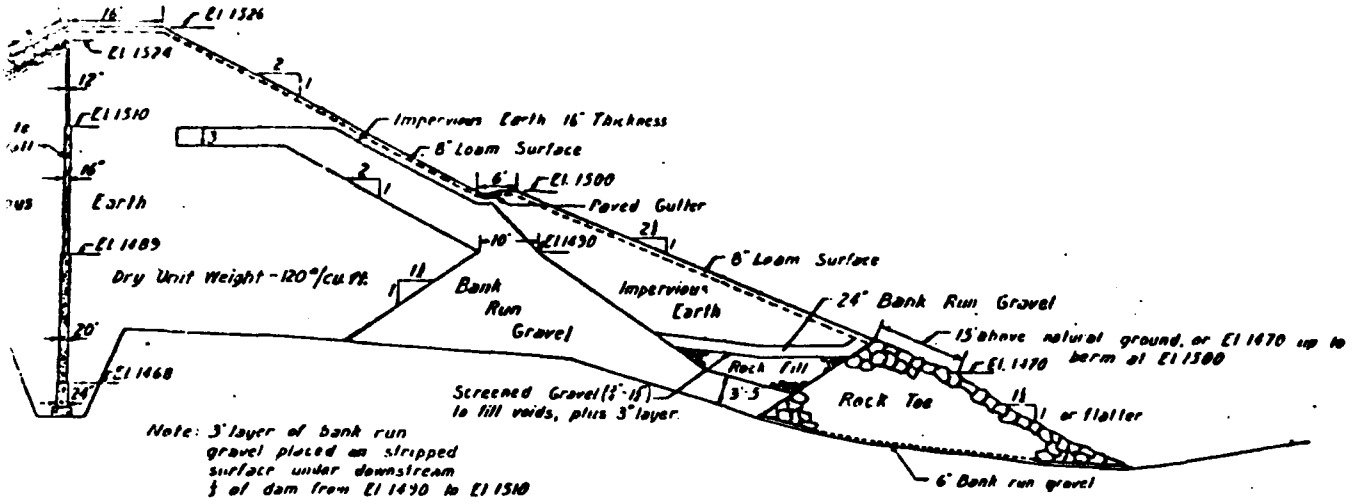
VERTICAL

NOTE: TAKEN FROM PLANS BY METCALF & EDDY DATED AUGUST 1946 AND MARCH 1949



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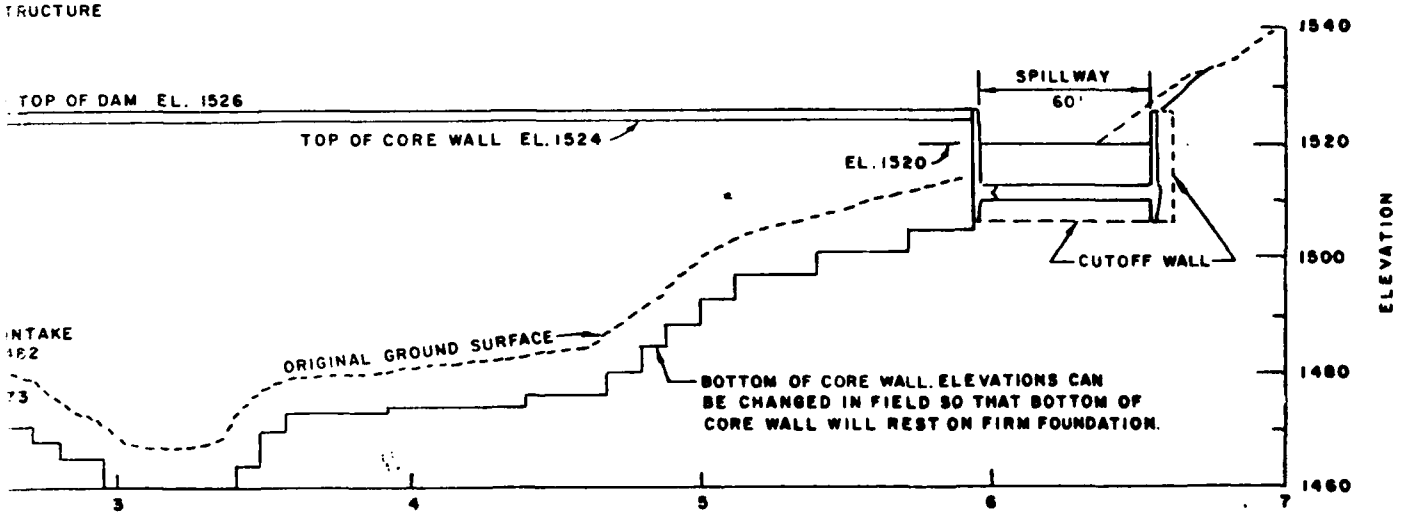

CENTER LINE OF CORE WALL

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VERTICAL

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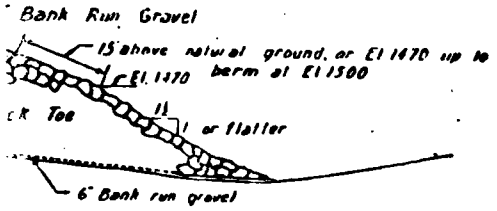

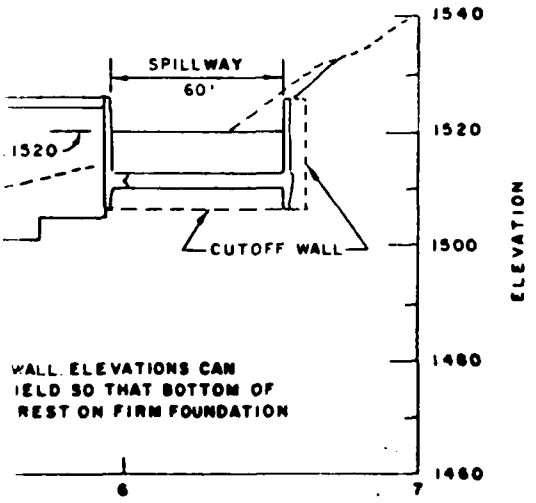

HAYDEN, HARDING & BUCHANAN, INC CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

UPPER SACKETT RESERVOIR DAM
VALVE CHAMBER

HINSDALE MASSACHUSETTS

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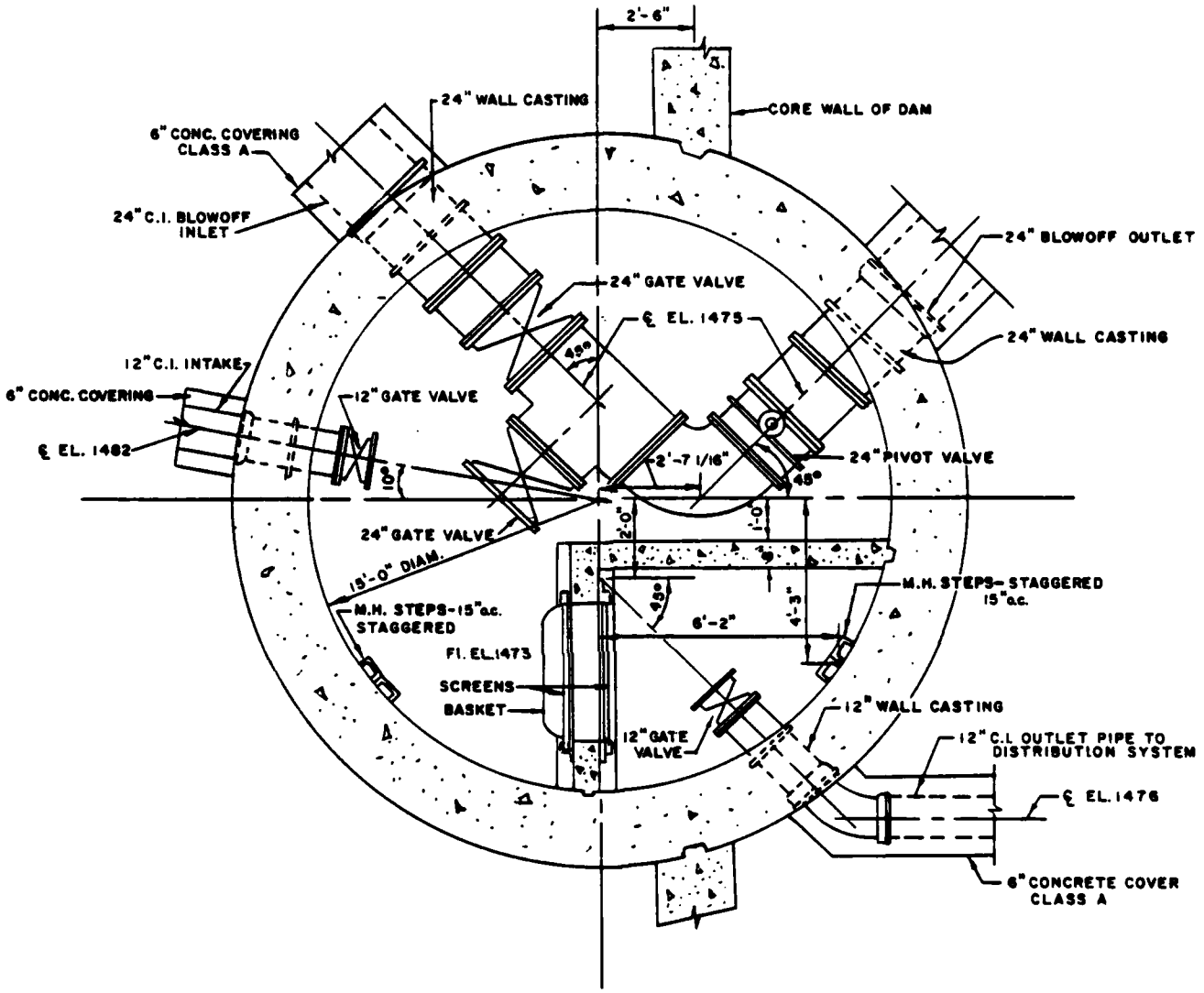
			DATE: AUGUST, 1981



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NOTE: TAKEN FROM PLANS BY MEDCALF & EDDY DATED AUGUST 1946

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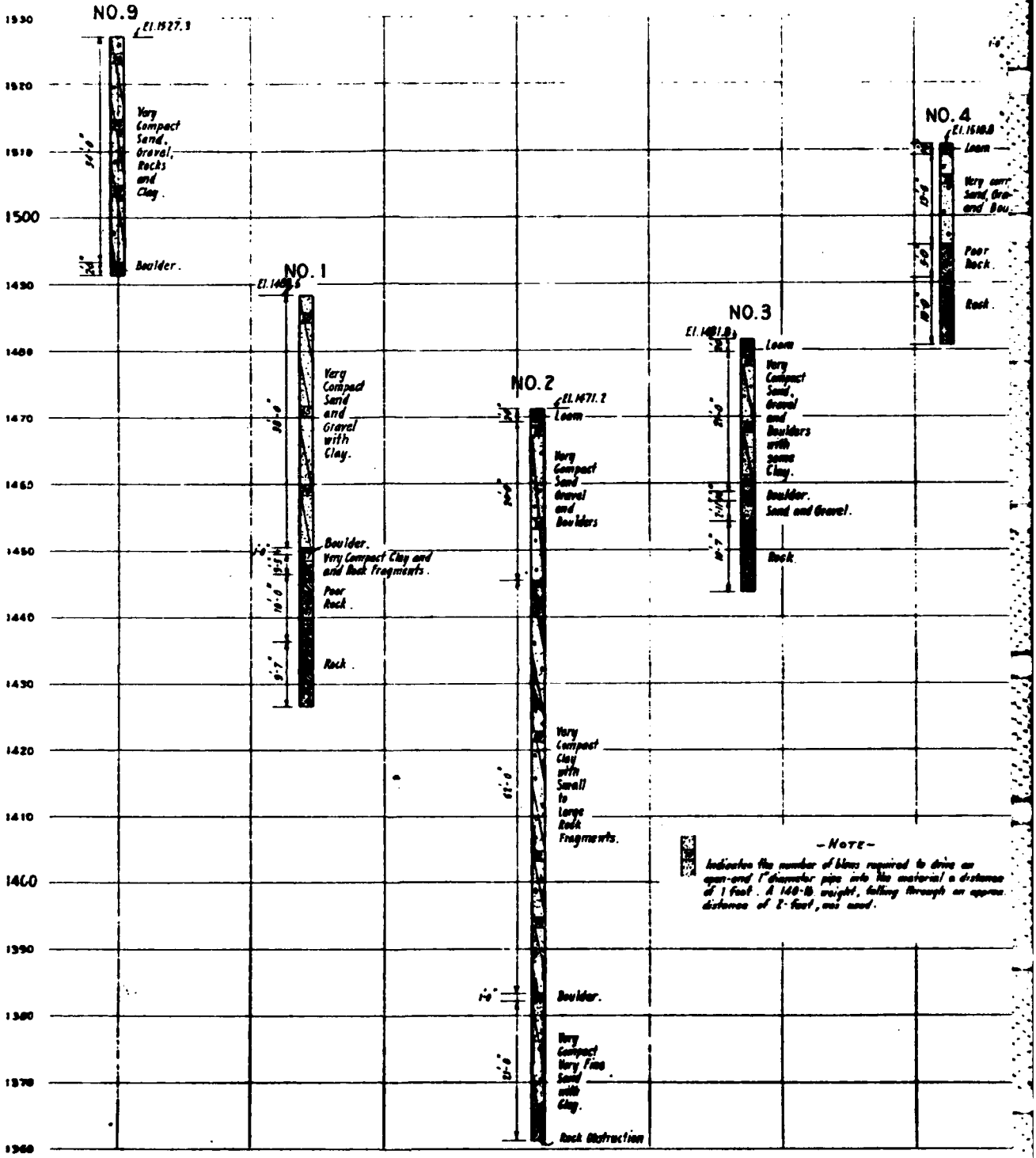
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

UPPER SACKETT RESERVOIR DAM
VALVE CHAMBER

HINSDALE MASSACHUSETTS

			SCALE: AS SHOWN
			DATE: AUGUST, 1981



DRAWN BY.....C.W.R.....
TRACED BY.....C.W.R.....
CHECKED BY.....W.C.....
APPROVED BY.....DEP. PROF. ENGR. MASS. NO. 70

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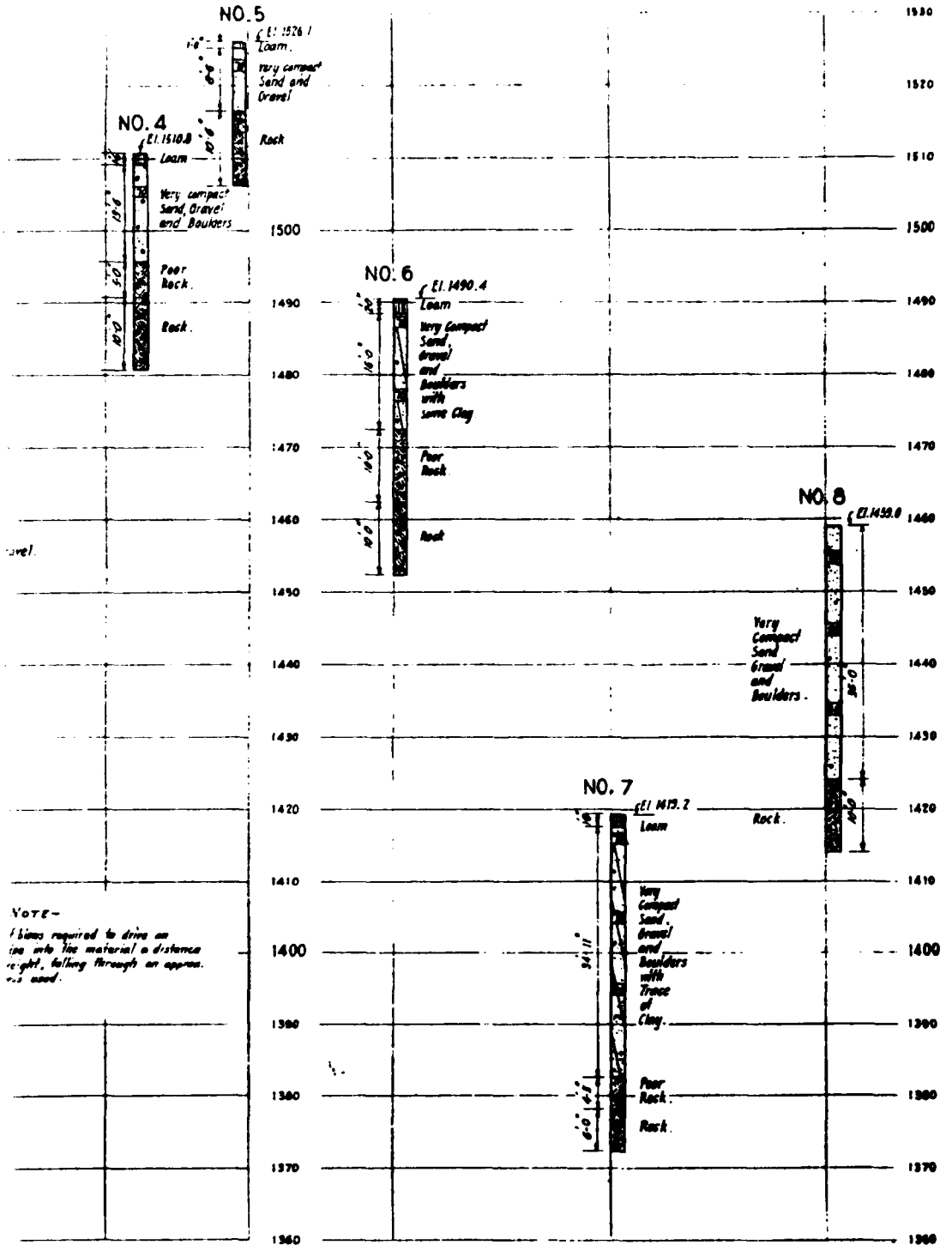

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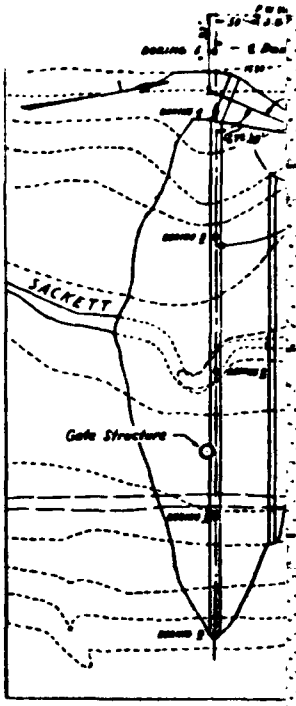

LOCATION PL

SCALE IN FEET

PITTSFIELD
SACRETT BROOK

BORING

SCALE - AS SHOWN

METCALF & EDDY
BOSTON, MASS.

NO.	DATE	BY	CHK'D	APP'D	DESCRIPTION

B-6

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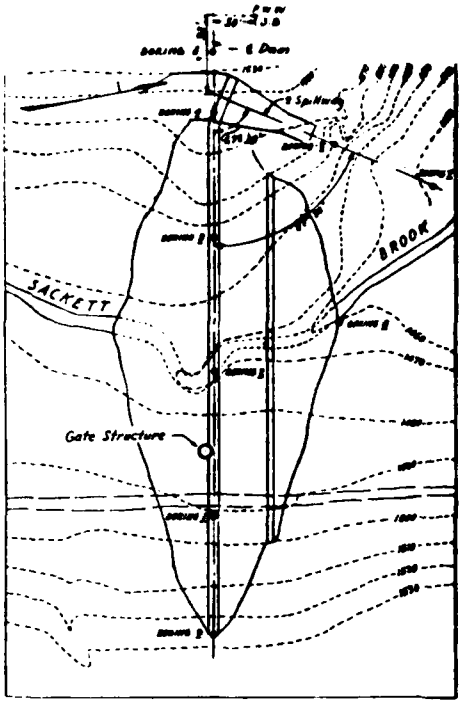
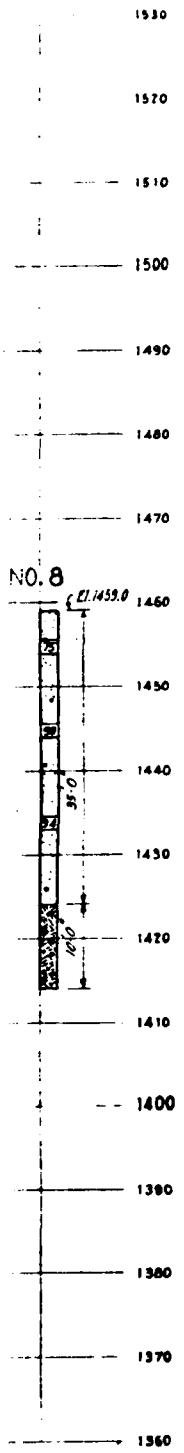


LOCATION PLAN

SCALE IN FEET



FITTSFIELD, MASS.
SACKETT BROOK RESERVOIR

BORING DATA

SCALE - AS SHOWN AUGUST 1946

METCALF & EDDY
ENGINEERS
BOSTON, MASS.

B-6

Sheet 3 of 13 Sheets

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The Commonwealth of Massachusetts

EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGR.
DIVISION OF WATERWAYS

100 Nashua Street, Boston 02114

February 14, 1977

City of Pittsfield
City Hall
Pittsfield, Mass. 01201

Re: Insp. Dam #1-2-132-7
New Upper Sacket Dam
Hinsdale

Attn: Mr. Louis Newbill
Dear Sir:

On September 29, 1976, an Engineer from the Massachusetts Department of Public Works made a visual inspection of the above dam. Our records indicate the owner to be the City of Pittsfield.
If this information is incorrect, will you please notify this office.

The inspection was made in accordance with the provisions of Chapter 253 of the Massachusetts General Laws as amended (Dams Safety Act). Chapter 706 of the Acts of 1975 transferred the jurisdiction of the so-called "Dams Safety Program" to the Commissioner of the Department of Environmental Quality Engineering.

The results of the inspection indicate that this dam is ~~conditionally~~ safe. The following conditions were noted that require attention:

Brush along the channel walls and on the upstream slope should be removed.

The spalled joint reported in 1974 has not been repaired. This should be corrected.

The settlement in back of the westerly channel wall should be corrected.

We call these conditions to your attention before they become serious and more expensive to correct. With any correspondence please include the number of the dam as indicated above.

Very truly yours,

John D. Hannon, P.E.
Chief Engineer

JDH: cc: Dean P. Amidon, D.H.E. Dist. 1
Robert Jordan, D.D.E. Dist. 1
✓ File

L-106

INSPECTION REPORT - DAMS AND RESERVOIRS

1. Location: ~~City~~/Town HINSDALE. Dam No. 1-2-132-7.

Name of Dam New Upper Sacket. Inspected by: RDJordan - RDSpaniol

Date of Inspection 9/29/76.

2. Prev. Inspection X.

Owner/s: per: Assessors_____.

Reg. of Deeds_____. Pers. Contact_____.

1. City of Pittsfield | City Hall | Pittsfield | 499-1100
   Name | St. & No. | City/Town | State Tel. No.

2. _____
   Name | St. & No. | City/Town | State Tel. No.

3. _____
   Name | St. & No. | City/Town | State Tel. No.

3. Caretaker [if any] e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Louis Newbill | City Hall | Pittsfield | 499-1100
Name | St. & No. | City/Town | State Tel. No.

4. No. of Pictures taken 1.

5. Degree of Hazard: [if dam should fail completely]*

1. Minor_____. 2. Moderate X.

3. Severe_____. 4. Disastrous_____.

*This rating may change as land use changes [future development]

6. Outlet Control: Automatic_____. Manual X.

Operative X yes:_____no.

Comments:_____

_____

Upstream face of Dam: Condition:

1. Good_____. 2. Minor Repairs_____.

3. Major Repairs_____. 4. Urgent Repairs_____.

Comments:_____

_____

8. Downstream Face of Dam: Concition: 1. Good X. 2. Minor Repairs___.
3. Major Repairs___ 4. Urgent Repairs___.

Comments: _____

_____

9. Emergency Spillway: Condition: 1. Good X. 2. Minor Repairs_____.
3. Major Repairs_____.4. Urgent Repairs_____.

Comments: _____

_____

_____

10. Water level @ time of inspection: 2.5' ft. above_____. below X.
top of dam_____.
principal spillway_____.
other emergency spillway.

11. Summary of Deficiencies Noted:

Growth [Trees and Brush] on Embankment X.

Animal Burrows and Washouts_____.

Damage to slopes or top of dam_____.

Cracked or Damaged Masonry X.

Evidence of Seepage_____.

Evidence of Piping_____.

Erosion_____.

Leaks_____.

Trash and/or debris impeding flow_____.

Clogged or blocked spillway_____.

Other_____.

DAM NO. 1-2-150-7

12. Remarks & Recommendations: [Fully Explain] PREVIOUS INSPECTION DATE: January 29, 1974

In general the dam is in good condition. The embankment is stable; no sloughs or settlement was noted. Some light brush is growing on the upstream slope.
The concrete spillway is good except for the spalled joint reported in 1974. The brush growing along the channel walls has not been removed, nor has the settlement in back of the westerly channel wall been repaired.
Except for these minor deficiencies, the dam appears to be safe.

For location see Topo Sheet 5-A.

---

13. Overall Condition:

1. Safe X.
2. Minor repairs needed X
3. Conditionally safe - major repairs needed_____.
4. Unsafe_____.
5. Reservoir impoundment no longer exists [explain]

   Recommend removal from inspection list_____.

Y25

February 25, 1974

Lewis A. Newbill, Chief Water Engineer
Pittsfield Water Commission
Water Department
Pittsfield, Massachusetts

RE: Inspection - Dams #1-2-102-4 & 7
Hinsdale
Cleveland Reservoir &
Sackett - New Upper Dams

Dear Mr. Newbill:

On January 29, 1974, an engineer from the Massachusetts Department of Public Works inspected the above dams, owned by the City of Pittsfield.

The inspections were made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspections indicate that these dams are safe and well maintained. The following minor deficiencies were noted:

Cleveland Reservoir - Dam #1-2-102-4

1. Widely scattered growth of brush in the upstream rock slope.

2. The growth of brush at the toe and lower downstream slope.

According to the report these areas will be attended to this summer.

Sackett - New Upper - Dam #1-2-102-7

1. Some minor spalling at an expansion joint in the westerly wall which should be repaired.

2. Remove the light growth of brush from the upstream rock slope and along the spillway channel walls.

3. The earth abutting the westerly spillway and channel has settled and impedes surface runoff. This area should be filled with suitable material, properly compacted and graded, and should be observed carefully for possible future settlement.

We call these conditions to your attention now, before they become serious and more expensive to correct.

Very truly yours,

F C Schweim

FRED. C. SCHWEIM
Deputy Chief Engineer

LRA:jmp
c.c. D. P. Amidon
R. Jordan

L-108

INSPECTION REPORT - DAMS AND RESERVOIRS

1. Location: ~~City~~/Town HINSDALE. Dam No. 1-2-132-7.

Name of Dam Sackett - New Upper. Inspected by: RDJordan-PFFezzie

Date of Inspection 1/29/74.

2. Prev. Inspection X.

Owner/s: per: Assessors_____.

Reg. of Deeds_____. Pers. Contact_____.

1. City of Pittsfield - City Hall - Pittsfield, MA 499-1100
   Name | St. & No. | City/Town | State | Tel. No.
2. _____
   Name | St. & No. | City/Town | State | Tel. No.
3. _____
   Name | St. & No. | City/Town | State | Tel. No.

3. Caretaker [if any] e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Louis Newbill City Hall Pittsfield,MA 499-1100
Name | St. & No. | City/Town | State | Tel. No.

4. No. of Pictures taken 3.

5. Degree of Hazard: [if dam should fail completely]*

1. Minor_____. 2. Moderate X.

3. Severe_____. 4. Disastrous_____.

*This rating may change as land use changes [future development]

6. Outlet Control: Automatic_____. Manual X.

Operative X yes_____no.

Comments:_____

_____

Upstream face of Dam: Condition:

1. Good X. 2. Minor Repairs_____.

3. Major Repairs_____. 4. Urgent Repairs_____.

Comments:_____

_____

_____

8.

Downstream Face of Dam: Condition: 1. Good X. 2. Minor Repairs___.

3. Major Repairs___ 4. Urgent Repairs___.

Comments:_____

_____.

9.

Emergency Spillway: Condition: 1. Good_____. 2. Minor Repairs_____.

3. Major Repairs_____. 4. Urgent Repairs_____.

Comments:_____

_____

_____

10.

Water level @ time of inspection: 0.1 ft. above x. below_____.

top of dam_____.

principal spillway x.

other_____.

11.

Summary of Deficiencies Noted:

Growth [Trees and Brush] on Embankment x.

Animal Burrows and Washouts_____.

Damage to slopes or top of dam_____.

Cracked or Damaged Masonry x.

Evidence of Seepage_____.

Evidence of Piping_____.

Erosion_____.

Leaks_____.

Trash and/or debris impeding flow_____.

Clogged or blocked spillway_____.

Other_____.

12. Remarks & Recommendations: [Fully Explain]

The embankment and top of the dam is in good condition. Some very light brush is growing through the upstream rock slope. The condition is minor at this time.

The concrete spillway is o.k. , except for some spalling at an expansion joint in the westerly wall. The brush growing along the spillway channel walls should be removed.

The earth abutting the westerly spillway and channel wall has settled. This condition hampers surface water runoff. The City should be advised to fill and seed the low areas adjacent to the wall to allow for proper drainage. Also, the spalled expansion joint should be repaired.

Investigation of the toe showed it to be dry and stable.

Except for the noted deficiencies, the dam appears to be safe.

The description of the structure was submitted in 1972. No changes were noted.

For location see Topo Sheet 5-A.

13.

Overall Condition:

1. Safe X .
2. Minor repairs needed _____.
3. Conditionally safe - major repairs needed _____.
4. Unsafe _____.
5. Reservoir impoundment no longer exists [explain]

   Recommend removal from inspection list _____.

PITTSFIELD WATER COMMISSION
WATER DEPARTMENT
CITY OF PITTSFIELD
MASSACHUSETTS
01201

January 15, 1973

Mr. Malcolm E. Graf
Associate Commissioner
Mass. Executive Office of Transportation & Construction
Department of Public Works
Office of the Commissioner
100 Nashua Street
Boston, Mass. 02114

RE: Inspection of Pittsfield Dams
in Washington, Hindsdale and Dalton

Dear Mr. Graf:

This is to inform you of action being taken by the Pittsfield Water Department in regards to Sackett Distributor, Ashley Lake and Farnham Reservoir Dams.

The consulting engineering firm of Metcalf & Eddy will be engaged by this Department to make an in-depth survey of Ashley Lake and Farnham Dams to determine the nature and the extent of repairs required. This effort will be scheduled for the Spring of 1973.

With regards to Sackett Distributor Dam, we are still awaiting word from the Selectmen of the Town of Dalton on whether or not the Town of Dalton intends to take over responsibility for this dam and to provide water for the approximately 22 families being serviced by this reservoir.

Very truly yours,

WATER DEPARTMENT

Lewis A. Newbill
Chief Water Engineer

LN/ba

November 8, 1972

Mr. Lewis A. Newbill
Chief Water Engineer
Pittsfield Water Commission
Water Department
Pittsfield, Massachusetts

RE: Inspection of Pittsfield Dams
in Washington, Hinsdale and Dalton

Dear Mr. Newbill:

The Massachusetts Department of Public Works has inspected dams, in the above towns, owned by the City of Pittsfield.

The inspections were made in accordance with the provisions of Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspections are as follows:

(A) Dalton - New Lower Ashley Dam #1-2-70-1

1. This dam is well maintained and in good condition

(B) Dalton - Sackett Distributor Dam #1-2-70-4

1. Remove heavy brush along the entire dam
2. Repair or replace the spillway
3. Repair the downstream concrete face
4. Repair or replace gate mechanism

WITH DAM AS NOTED. We are aware of the fact that although the reservoir is no longer used by the City of Pittsfield, it does service approximately 22 families in Dalton. You are hereby directed to immediately lower the reservoir to a safe level and

maintain that level until repairs are completed to render the dam safe. If repairs are not contemplated then breaching is the alternative.

(C) Dalton - Hathaway Distributor Dam #1-2-70-10

1. Damaged masonry

2. Damaged slopes

This dam is unsafe. It is recognized that there is no impoundment and that the City does not plan to use this facility. It is recommended that a wide breach be established to prevent any impoundment from heavy runoff. Notification is expected once breaching is accomplished.

(D) Hinsdale - Cleveland Reservoir Dam #1-2-132-4

1. Remove heavy brush from the lower portion of the slope

This dam is well maintained and in good condition.

(E) Hinsdale - Sackett New Upper Dam #1-2-132-7

This dam is well maintained and in good condition.

(F) Washington - Ashley Lake Dam #1-2-313-1

1. Severe deterioration and damage from ice was noted along the upstream masonry face, must be repaired.

2. Downstream mortar joints are in poor condition and need repointing.

3. Pressure leaks through masonry exist.

4. Find the cause of seepage along the downstream toe and correct.

THIS DAM IS UNSAFE. You are hereby directed to immediately drawdown the reservoir to a safe level and maintain that level until repairs have been completed to render the dam safe. It is noted that at the time of inspection the gates were being replaced and that brush and trees had recently been cut from the downstream face and toe area.

(G) Washington - Farnum Reservoir Dam #1-2-313-5

1. Correct seepage at the spillway about 40 feet from the toe

2. The gunite face of the spillway is badly cracked and deteriorated

3. In-depth inspection by a Professional Civil Engineer is imperative

Failure of this dam would be DISASTROUS TO THE TOWN OF LENOX. This dam, because of its age and condition needs expert opinion and advice.

(H) Washington - Sandmach Dam #1-2-313-9

1. Repair minor spalling along the spillway

This dam is well maintained and in good condition.

An early reply with specific action plans are necessary for the Sackett Distributor, Ashley Lake and Farnum Reservoir Dams.

Very truly yours,

MALCOLM E. GRAF
ASSOCIATE COMMISSIONER

MEG:mlb
cc: Board of Selectmen, Dalton
Board of Selectmen, Lenox
D.P. Imldon
R. Jordan

L-168

INSPECTION REPORT - DAMS AND RESERVOIRS

1. Location: City/Town HINSDALE. Dam No. 1-2-132-7.

Name of Dam Sackett - New Upper. Inspected by: R D Jordan.

Date of Inspection_____.

---

2. Prev. Inspection X.

Owner/s: per: Assessors_____.

Reg. of Deeds_____. Pers. Contact_____.

1. City of Pittsfield | City Hall | Pittsfield, MA | 499-1100
   Name | St. & No. | City/Town | State Tel. No.

2. _____
   Name | St. & No. | City/Town | State Tel. No.

3. _____
   Name | St. & No. | City/Town | State Tel. No.

---

3. Caretaker [if any] e.g. superintendent, plant manager, appointed by absentee owner, appointed by multi owners.

Louis Newbill | City Hall | Pittsfield, MA | 499-1100
Name | St. & No. | City/Town | State Tel. No.

---

4. No. of Pictures taken 3.

---

5. Degree of Hazard: [if dam should fail completely]*

1. Minor_____. 2. Moderate X.

3. Severe_____. 4. Disastrous_____.

*This rating may change as land use changes [future development]

---

6. Outlet Control: Automatic_____. Manual X.

Operative x yes:_____no.

Comments:_____

_____

---

7. Upstream Face of Dam: Condition:

1. Good X. 2. Minor Repairs_____.

3. Major Repairs_____. 4. Urgent Repairs_____.

Comments:_____

_____

_____

8. Downstream Face of Dam: Condition: 1. Good X. 2. Minor Repairs___.
3. Major Repairs___ 4. Urgent Repairs___.

Comments: _____

_____.

---

9. Emergency Spillway: Condition: 1. Good_____. 2. Minor Repairs_____.
3. Major Repairs_____. 4. Urgent Repairs_____.

Comments: _____

_____

_____

---

10. Water level @ time of inspection: 8 ft. above_____. below x.
top of dam_____.
principal spillway x.
other_____.

---

11. Summary of Deficiencies Noted:

Growth [Trees and Brush] on Embankment None.
Animal Burrows and Washouts "
Damage to slopes or top of dam "
Cracked or Damaged Masonry "
Evidence of Seepage "
Evidence of Piping "
Erosion "
Leaks "
Trash and/or debris impeding flow "
Clogged or blocked spillway "
Other "

12. Remarks & Recommendations: [Fully Explain]

Mr. L. Newbill, J. Pierce, and A. Gerlach, of the Pittsfield Water Department were present at the inspection.

The City has a continuous imspection and maintenance program in operation for this dam. The slopes and embankment are in good condition and well mowed. The concrete spillway shows no signs of cracking or spalling and is in good repair.

The failure of this dam would destroy lower Sackett dam and could imperil life and property along Kerchner Road, and Mountain Drive and Washington Mountain Road.

13. Overall Condition:

1. Safe X.
2. Minor repairs needed_____.
3. Conditionally safe - major repairs needed_____.
4. Unsafe_____.
5. Reservoir impoundment no longer exists [explain]

   Recommend removal from inspection list_____.

March 1, 1972

Mr. Lewis Newbill, Water Engineer
Water Department
City Hall
Pittsfield, Massachusetts

re: Inspection of Dam
Hinsdale
Sackett-New Upper Dam

Dear Mr. Newbill:

The Massachusetts Department of Public Works inspected Sackett-New Upper Dam in the Town of Hinsdale, of which the City of Pittsfield is the owner.

The inspection was made in accordance with Chapter 253 of the Massachusetts General Laws, as amended by Chapter 595 of the Acts of 1970.

The results of the inspection indicated that no immediate maintenance or repairs were required; however, the following items were noted that will require your attention in the future:

1. Remove debris and growth from spillway.
2. Repair broken 24-inch outlet pipe.

We are calling these items to your attention now before they become more serious and expensive to correct.

Very truly yours,

F.C. Schnebel

FRED. C. SCHNEBEL P.E.
Deputy Chief Engineer

LBM:eh
C.C.-Jean P. Hamilton Dist. #1

L-169

DESCRIPTION OF DAM

DISTRICT ONE .

Submitted by R D Jordan Dam No. 1-2-132-7

Date 9-23-74 . City/Town HINSDALE

Name of Dam Sackett - New Upper

---

1. Location: Topo Sheet No. 5-A .

Provide 8-1/2" x 11" in clear copy of topo map with location of Dam clearly indicated.

---

2. Year built: 1947 . Year/s of subsequent repairs 1947

---

3. Purpose of Dam: Water Supply X . Recreational ____ .

Irrigation ____ . Other ____ .

---

4. Drainage Area: 1 sq. mi. ____ acres.

---

5. Normal Ponding Area: ____ Acres; Avc. Depth ____ .

Impoundment: 155 MG gals; ____ acre ft.

---

6. No. and type of dwellings located adjacent to pond or reservoir ____

i.e. summer homes etc. ____

---

7. Dimensions of Dam: Length 640' . Max. Height 60' .

Slopes: Upstream Face 3/1 earth - rock covered .

Downstream Face 3/1 earth .

Width across top 15' .

---

8. Classification of Dam by Material:

Earth with conc. core . Conc. Masonry ____ . Stone Masonry ____ .

Timber ____ . Rockfill ____ . Other ____ .

---

9. A. Description of present land usage downstream of dam: ____

50 %rural; 50 % urban.

B. Is there a storage area or flood plain downstream of dam which could accommodate the impoundment in the event of a complete dam failure

Yes ____ . No X .

DAM NO. 1-2-132-7.

10.

Risk to life and property in event of complete failure.

No. of people See Report.

No. of homes_____.

No. of Businesses_____.

No. of Industries_____. Type_____.

No. of Utilities_____. Type_____.

Railroads_____.

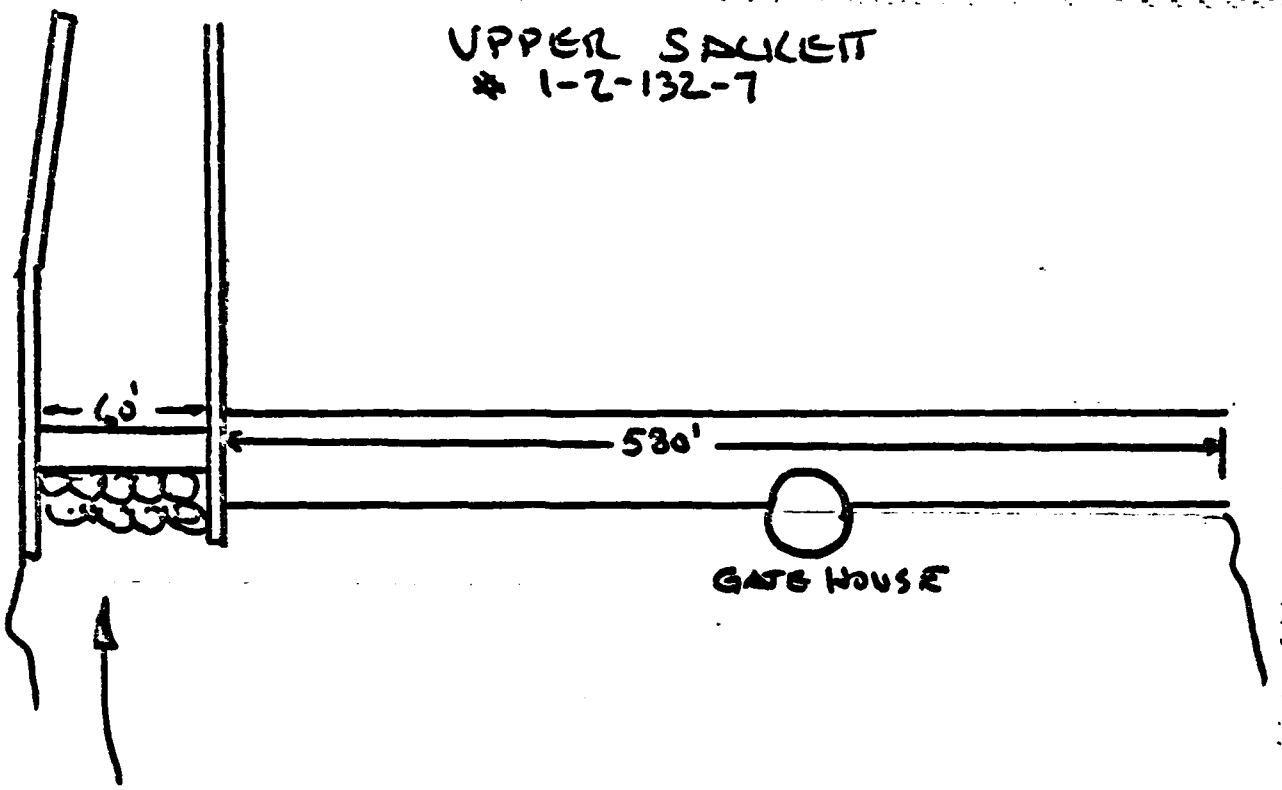
Other dams_____.

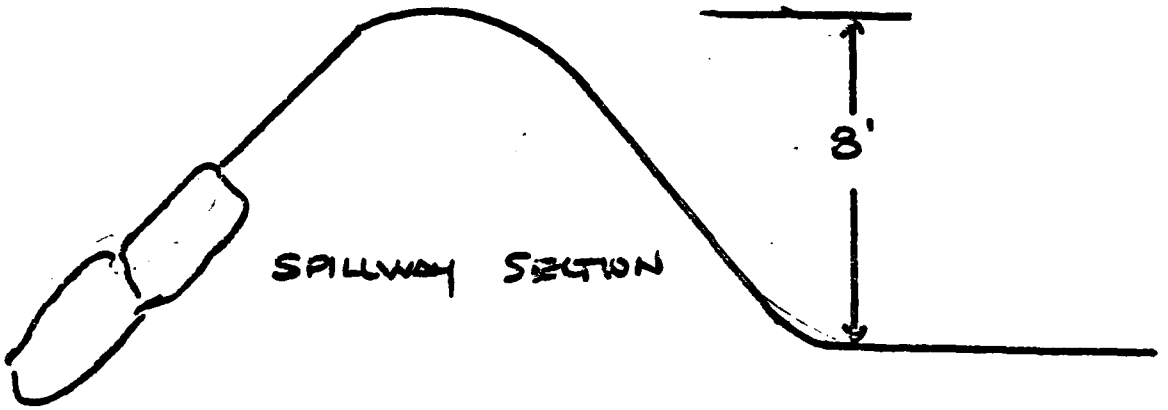
Other_____.

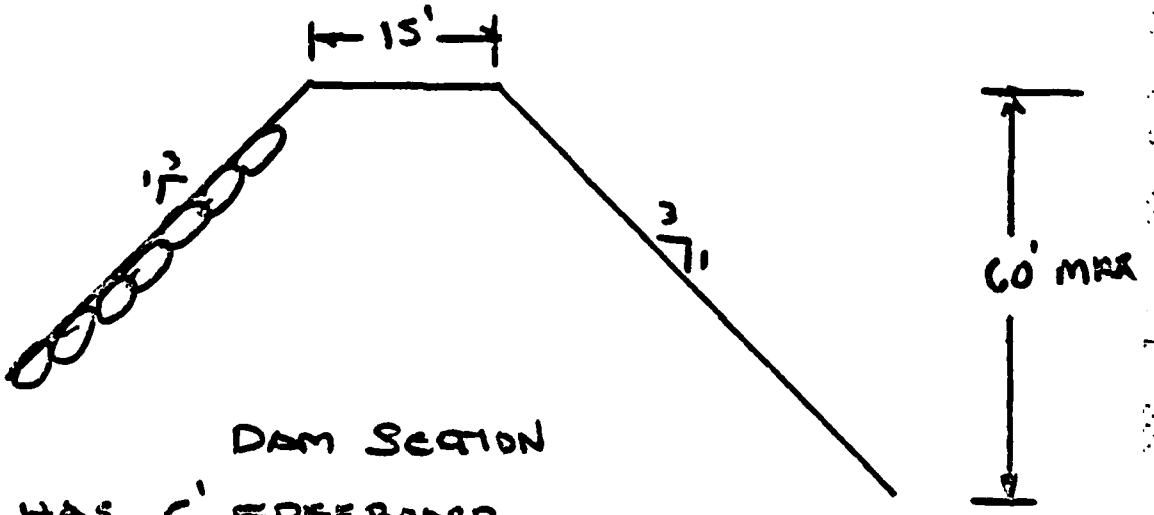
11.

Attach Sketch of dam to this form showing section and plan on 8-1/2" x 11" sheet.

UPPER SACKETT
1-2-132-7

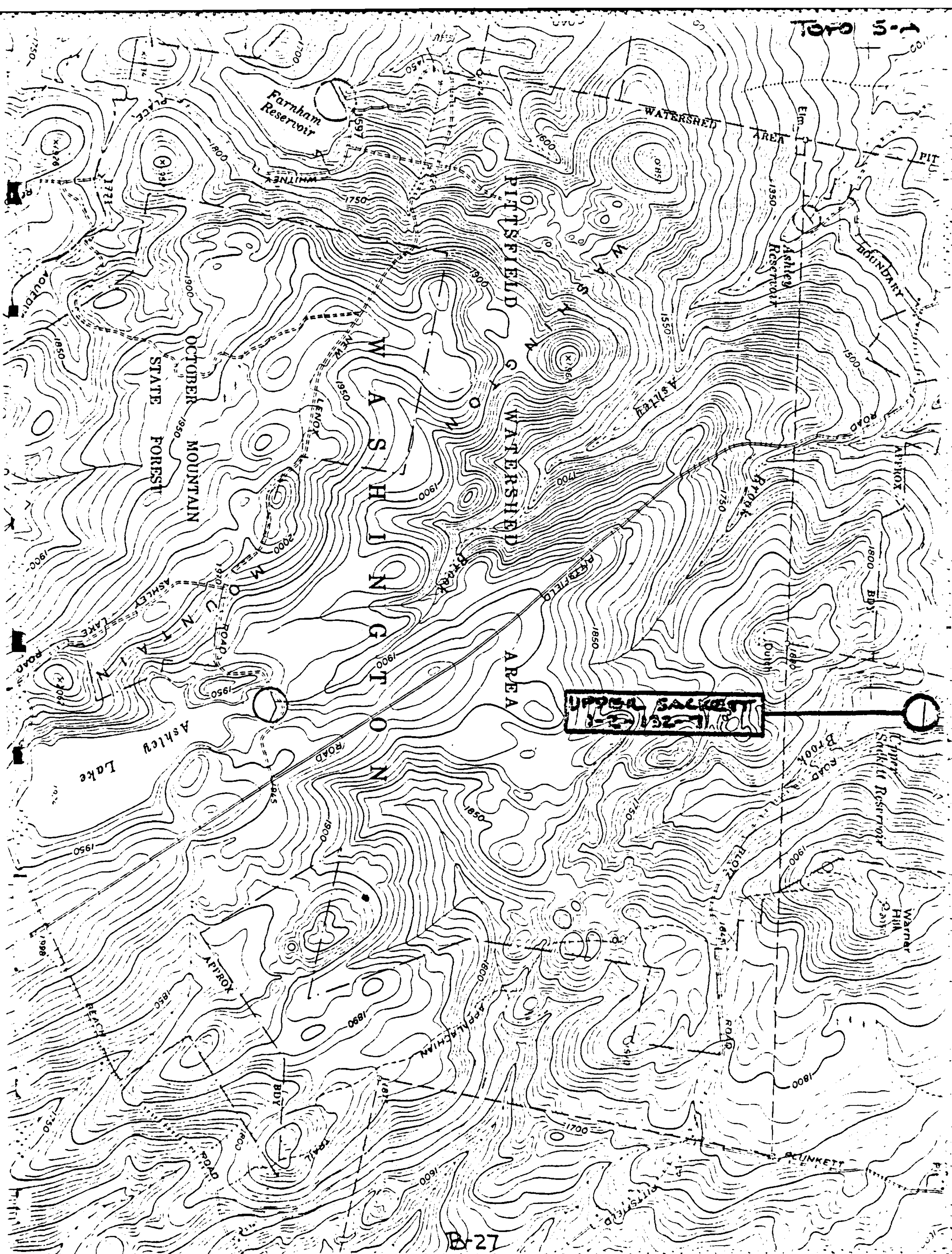






DAM SECTION

DAM HAS 6' FREEBOARD


Farnham Reservoir
WATERSHED AREA
PITTSFIELD WATERSHED AREA
WASHINGTON
OCTOBER MOUNTAIN STATE FOREST
MOUNTAIN
Ashley Lake
Ashley Reservoir
Ashley Brook
BOUNDARY
APPROX BDY
NEW LENOX
ASHLEY LAKE ROAD
PITTSFIELD ROAD
UPPER SACKETT
Upper Sackett Reservoir
Warner Hill
APPALACHIAN TRAIL
PLUNKETT
WHITNEY
AQUEDUCT
Elm
PIT
1700
1750
1800
1850
1900
1950
2000
1550
1600
1500
1350

INSPECTION OF DAMS Dam #11-7

City or Town of Hinsdale Date June 1, 1971

Name of Dam Sackett - New Upper Inspector R.Northrup P.Pezzie

Owner City of Pittsfield Address City Hall - Pittsfield

Caretaker City of Pittsfield Address City Hall - Pittsfield

Location South of Pittsfield Rd. (Kirchner Rd.) ½ mile from Dalton Town Line

Type of Dimensions Earth fill - concrete core - 600' long - 60' high

Spillway, type and size 60' long - 6' freeboard

Outlets, type and size 24" CI blow off - 24" & 12" water mains

Flashboards, type and height none

Date Built 1947 Condition good - except as noted

When last repaired 1947 By whose orders

Nature of Repairs

Purpose of Dam water supply - City of Pittsfield

Approximate storage of water 155 MG

Approximate area of water shed 1 square mile

Possible damage due to failure of dam to life and property below

Remarks water 1" below spillway - debris and growth in spillway - some concrete missing corner of wingwall - water running from riprap at 24" outlet - pipe is apparently broken inside of embankment

Recommendations clean and repair spillway as needed, repair outlet pipe

COUNTY OF BERKSHIRE, MASS.

INSPECTION OF DAMS

City or Town of Hinsdale Date 12, August 1966

Name of Dam Sackett New Upper Inspector Louis J. Diamond

Owner City of Pittsfield Address 33 Pearl St. Tel. _____

Caretaker Geo Pleau Address 147 Longview Terr. Tel. 2-7375

Location S.W. part of town -westerly of Pittsfield Rd.

Type and Dimensions Earth fill-Conc. core- 600' lg. -60' hbgh.

Spillway, type and size Conc, 60' lg 6';freeboard.

Outlets, type and size 24" C.I.- blow-off; 24" and 12" lines.

Flashboards, type and height None

Date Built 1947 Condition Good

When last repaired -- By whose orders _____

Nature of Repairs --

Purpose of Dam Water Supply-city of Pittsfield.

Approximate storage of water 150,000,000 gals.

Approximate area of water shed 1 sq. mi.

Possible damage due to failure of dam Could damage property below.

Remarks Water down 8" -Youth corps has completed clearance of structure.-O.K.

Recommendations

FINAL REPORT ON THE CONSTRUCTION OF

SACKETT BROOK UPPER DAM AND APPURTENANCES

MARCH 15, 1949 2044
MEDCALF & EDDY

STATISTICS

Area of watershed	1.0	sq. mi.
Capacity of reservoir	155	mil. gal.
Surface area of reservoir	21	acres
Estimated safe yield	0.75	mil. gal. daily
Top of dam	El. 1526	
Top length of dam	660	ft.
Maximum height at center line of dam	60	ft.
Maximum width of dam at base	300	ft.
Top width	16	ft.
Freeboard	6	ft.
Volume of earth fill	100,000	cu. yd.
Volume of concrete		
Core wall	1,360	cu. yd.
Gate structure	267	cu. yd.
Spillway	833	cu. yd.
Conduits and misc.	220	cu. yd.
Total	2,680	cu. yd.
Spillway crest length	60	ft.
Spillway design discharge capacity	1,125	cu. ft. per sec.
Spillway crest	El. 1520	
Length of relocated highway	2,400	lin. ft.

The reservoir is located on Sackett Brook just west of the old Pontoosuc Turnpike, so-called, now known as Kirchner Road in the town of Hinsdale just east of the southeast corner of Dalton township, about five miles east-southeast from Park Square, Pittsfield. The watershed is uninhabited and largely wooded.

The reservoir designed to serve primarily for storage has generally steep sides and a flat bottom. Clearing and grubbing of the entire area was carried up to two feet above the flow line.

The earth fill dam contains a concrete core wall, a 24-in. blowoff outlet pipe through which water may be discharged to the

old intake reservoir about 1,000 ft. downstream by way of the original brook channel, and also a 12-in. intake at a slightly higher level and a 12-in. outlet pipe. The 12-in. outlet pipe was provided for a possible future direct connection of this reservoir to the distribution system. All pipes pass through the concrete gate structure, topped with a brick operating room where gate controls are provided.

The upstream surface of the dam is protected with cyclopean riprap down to El. 1485 and the downstream surface is loamed and seeded to grass, and provided with a rock toe below a gravel drain section of bank-run gravel.

The spillway is at the west end of the dam. Below the concrete overflow weir section a concrete channel is provided northerly to a precipitous ledge, over which the flow is discharged to the original brook channel.

In order to permit the construction of this reservoir it was necessary to relocate a 2,200-ft. section of the old county highway along the easterly side of the reservoir.

Filter-protected tile drains were provided under the spillway discharge channel and along the downstream toe of the dam east of the brook channel.

The borrow areas were planted to conifers and seeded in the spring following construction operations after grading for erosion control.

Construction Methods. The clearing operations were speeded by the use of portable power-driven hand saws. Grubbing was done by bulldozers for the most part. Stumps were removed from the

site, placed in dumps, and covered with earth. Small brush was mowed and the entire area was raked and burned by a hand crew.

The damsite was cleared of loose surface boulders and stripped by bulldozers, as were also the borrow areas.

The core trench and pipeline trenches were excavated in part by backhoe and dragline, and in part by clamshell bucket, with final shaping by hand, and using pneumatic spades in tight material.

Clearing and preparation of the site was done in spite of cold rainy weather which persisted through the spring and into the early summer of 1947.

The major part of the earth fill was secured from the adjacent hillsides, above the relocated highway on the east and both above and below the flow line on the west. This location made it possible to place all this material with scrapers of 12- to 14-cu. yd. (cubic yard) capacity hauled by D-7 or D-8 caterpillar tractors. For the most part space limitations were such that 4 units were most effective.

Additional spreading was done by means of a road grader and a bulldozer operating on the fill. Stones were removed from the fill after spreading by rakes mounted on a bulldozer blade. The teeth were about 8 in. long and were set 6 in. apart on centers.

Compaction from the operation of the bulldozers and scrapers was found to be adequate for the most part. Extra passes of the equipment for compaction purposes were made when required. The use of a sheepsfoot roller was found to be impractical with the material used.

Backfill around conduits, core wall, and structures inaccessible to equipment was thoroughly compacted with hand-operated pneumatic tampers.

The gravel drainage section of bank-run gravel containing some 20,000 cu. yd. was hauled from a pit about 3 miles east of the site located just north of Muddy Pond between Route 8 and the B. & A. R. R. owned by Leona G. Fassell. This material was hauled in by small trucks of 2- to 5-cu. yd. capacity for the most part, loaded by a power shovel in the pit, spread and compacted by D-7 bulldozers on the fill.

The major part of the earth fill was placed during the months of September and October, which were almost rainless providing ideal conditions for these operations with this material which contained a large percentage of fines and a high natural water content.

The concrete was transit-mix furnished by the Berkshire Gravel Co. of Pittsfield, placed by means of a bottom discharge bucket handled by crane, and vibrated in place by means of a mechanical internal vibrator. Trunks were used where forms were over 5 ft. high. Final water content was determined by field consistency and slump tests.

Concrete was placed in sectional steel forms furnished by the Economy Forms Corporation of Des Moines, Iowa.

Materials and Tests. The concrete mix for the job was established by the Thompson & Lichtner Co., Inc., of Boston, and is summarized in the following:

Materials Properties

	Berkshire coarse sand	1" gravel blend	1-1/2" gravel blend
Weight dry loose, lb./cu.ft.	99	91	91
Specific gravity	2.68	2.62	2.62
Absorption, percent	0.4	0.7	0.7

Quantities per Cubic Yard

Class concrete	2,750 lb./sq. in. at 28 days	
Actual W/C ratio	6.5 gal./sack	
Approximate slump	3"	
Size gravel	1"	1-1/2"
Actual cement factor	6.0 sacks	5.75 sacks
Proportions, dry loose volumes	1-2.01-3.53	1-2.14-3.75

Condition of aggregates	Dry	Damp	Wet	Dry	Damp*	Wet
Cement, lb.	564	564	564	541	541	541
Sand, lb.	1,200	1,260	1,290	1,220	1,280	1,310
Gravel blend, lb.	1,930	1,960	1,970	1,960	1,990	2,000
Water, total gal. to add	41.2	30.5	26.4	39.6	28.8	24.7

*Mix used.

The 1-in. gravel blend referred to in the above consists of two parts 1-in. gravel combined with 1 part of 1-1/2-in. gravel.

The 1-1/2-in. gravel blend referred to consists of two parts by weight of 1-1/2-in. gravel and 1 part by weight of 1-in. gravel.

It is to be noted that the above size designations do not conform to the nomenclature used by the Berkshire Gravel Co. The size above designated as 1 in. is commercially known as 3/4 in. being mainly between 3/4-in. and 3/8-in. screens and the size above designated as 1-1/2 is commercially known as 1 in. being mainly between the 1-1/2-in. and 3/4-in. screens.

The major part of the concrete used in the work was proportioned as indicated in the preceding table for 1-1/2-in. gravel, "Damp."

Forty-three test cylinders were taken from time to time during the progress of the work to check compressive strength. Most of these were well above the required 2,750 psi., (pounds per square inch) but some failed prematurely, evidently due to defective casting of the cylinders.

The soil used in the major portion of the dam was so fine and impervious that it was not considered necessary to make tests of the permeability. By comparison with similar local soils which have been tested it is believed that it has a coefficient of permeability of the order of 0.1×10^{-4} cm./sec. (centimeter per second). By visual control the most impervious material was placed adjacent to and on each side of the core wall, and in the upstream section of the dam.

The soil is a well-graded glacial till containing a sufficiently high percentage of silt sizes, so that during the two-month drought when most of the fill was being placed the natural moisture content was maintained in the vicinity of 10 to 12 percent in the borrow, and was slightly higher than optimum at all times.

Field tests of compaction were made frequently during the progress of the work, in accordance with the procedure developed by R. R. Proctor. On the basis of the modified Proctor test, so-called, the actual compaction of the earth placed in the dam was found to be from 90 to 100 percent of the optimum, and the dry unit weight was found to range from 110 to 130 lb. per cu. ft.

(pound per cubic foot) with the following average of 29 representative tests:

121 lb./cu. ft. 95.6% compaction

Record Drawings. The details of the principal features of the work as constructed are shown on two sheets of drawings appended hereto.

Operation. The location of the valves and their function is shown on the "Plan of Valve Chamber" on Sheet 1 of the record drawings herewith.

Numbering the valves from 1 to 5 as the operating stands appear from right to left as one stands in the gate-house doorway looking in, the description of these valves is as follows:

Valve No. 1. This is a 24-in. Chapman List 37 FE pivot valve intended to control, by throttling, discharge of water into the brook below the dam. Provision for lubrication of trunnions is through two 1/4-in. copper tubes extending up to alemite fittings at the base of the floor stand. The manufacturer recommends 600W transmission grease.

Valve No. 2. This is a 24-in. Ludlow List 3 rising stem gate valve opening from the gate chamber into the blowoff pipe.

Valve No. 3. This is a 24-in. Ludlow List 3 rising stem gate valve in the blowoff pipe nearest the reservoir.

Valve No. 4. This is a 12-in. Ludlow List 4X rising stem gate valve, admitting water into the gate chamber from intermediate depth.

Valve No. 5. This is a 12-in. Ludlow List 4X rising stem gate valve admitting water from the gate chamber to the future 12-in. pipeline. It should never be opened until the future pipeline is connected with the lower end of the 12-in. pipe through the dam, the blank end of which is marked by a piece of 10-in. steel pipe set vertically near the toe of the dam, and painted red.

The functions of these valves are as follows:

A. To draw water from the bottom of the reservoir for discharge into the brook below the dam; close valves Nos. 4 and 5; open valve No. 3; control rate by partially opening valve No. 1. Valve No. 2 may be either open or closed.

B. To draw water from intermediate depth in reservoir, for discharge into the brook; close valves Nos. 3 and 5; open valves Nos. 2 and 4; control rate by partially opening valve No. 1.

C. To drain the gate house; close valves Nos. 3, 4, and 5; open valves Nos. 2 and 1.

D. A future operation. To draw water from bottom of reservoir for discharge into the future 12-in. direct connection; close valves Nos. 1 and 4; open valves Nos. 2, 3, and 5.

E. A future operation. To draw water from intermediate depth in reservoir for discharge into the future 12-in. direct connection; close valves Nos. 1 and 3; open valves Nos. 4 and 5. Valve No. 2 may be either open or closed.

Under normal conditions, all gate valves should be either fully closed or wide open. Valve No. 1 is intended for use where throttling is required.

The gate structure is provided with an intake chamber for the 12-in. outlet protected by double screens having 3 meshes per inch. This chamber and the screens will be needed if and when the 12-in. outlet is connected directly into the system. The double screens permit the removal of one for cleaning, leaving the chamber protected by the other. A chain hoist and a special grapple are provided for handling the screens.

A ladder of cast-iron manhole steps leads from the manhole at the left of the gate-house door to the bottom of the above described intake chamber.

Another similar ladder leads to the bottom of the gate structure from the large opening with double checkered plate covers nearly opposite the gate-house door.

A weir having a 3-ft. crest has been provided in the brook channel below the dam for measuring seepage and low discharges through the 24-in. blowoff pipeline.

Attached is a curve showing the approximate capacity of the reservoir to various elevations of water surface. This is based on the topographic survey made by the City Engineer's office in 1944, no detailed resurvey having been made subsequent to construction.

The logs of borings prior to construction are shown on the contract drawings. These drawings and the logs of additional borings made during construction are on file with the County Engineer.

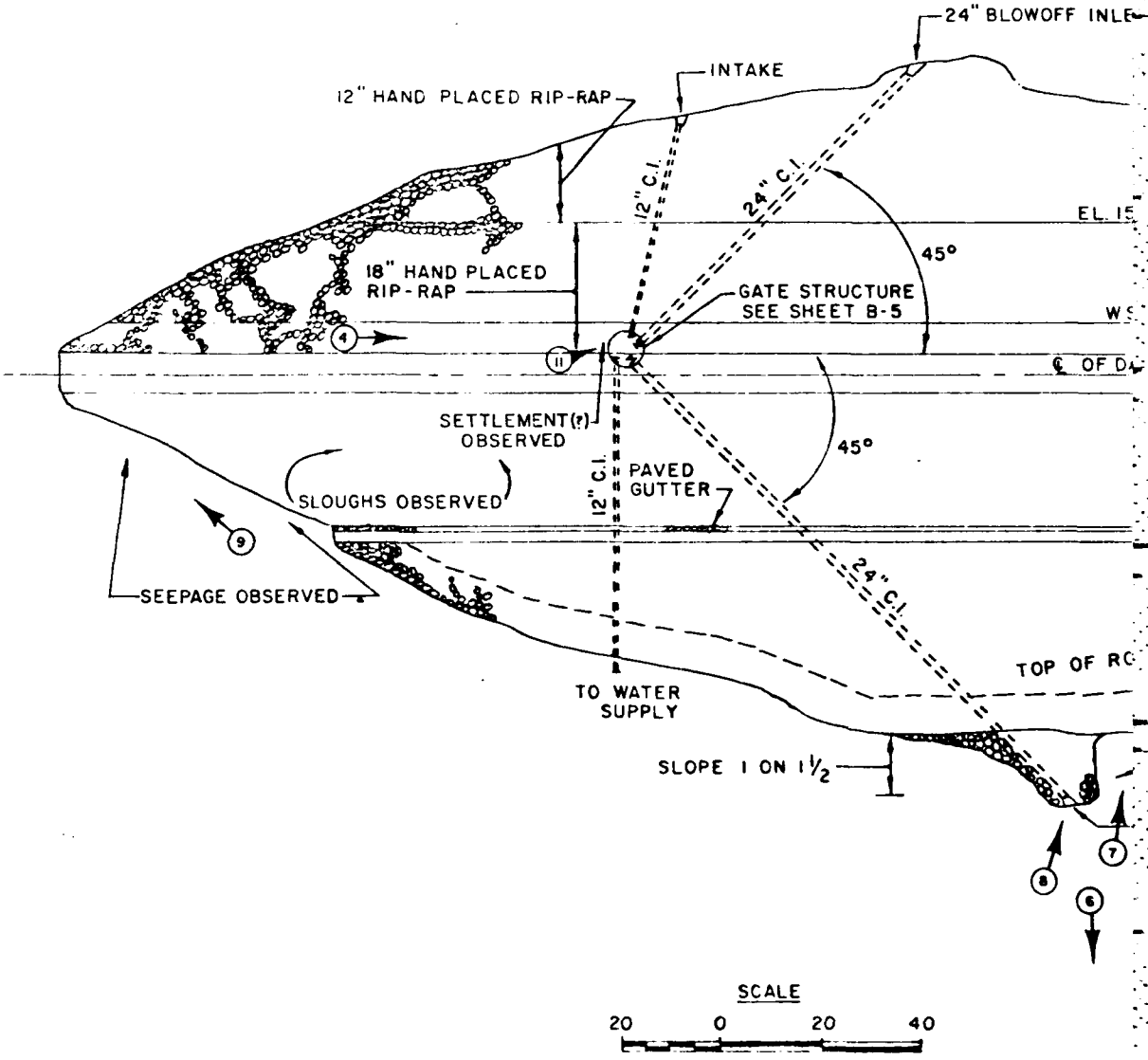
Respectfully submitted,

METCALF & EDDY

By Arthur L. Shaw

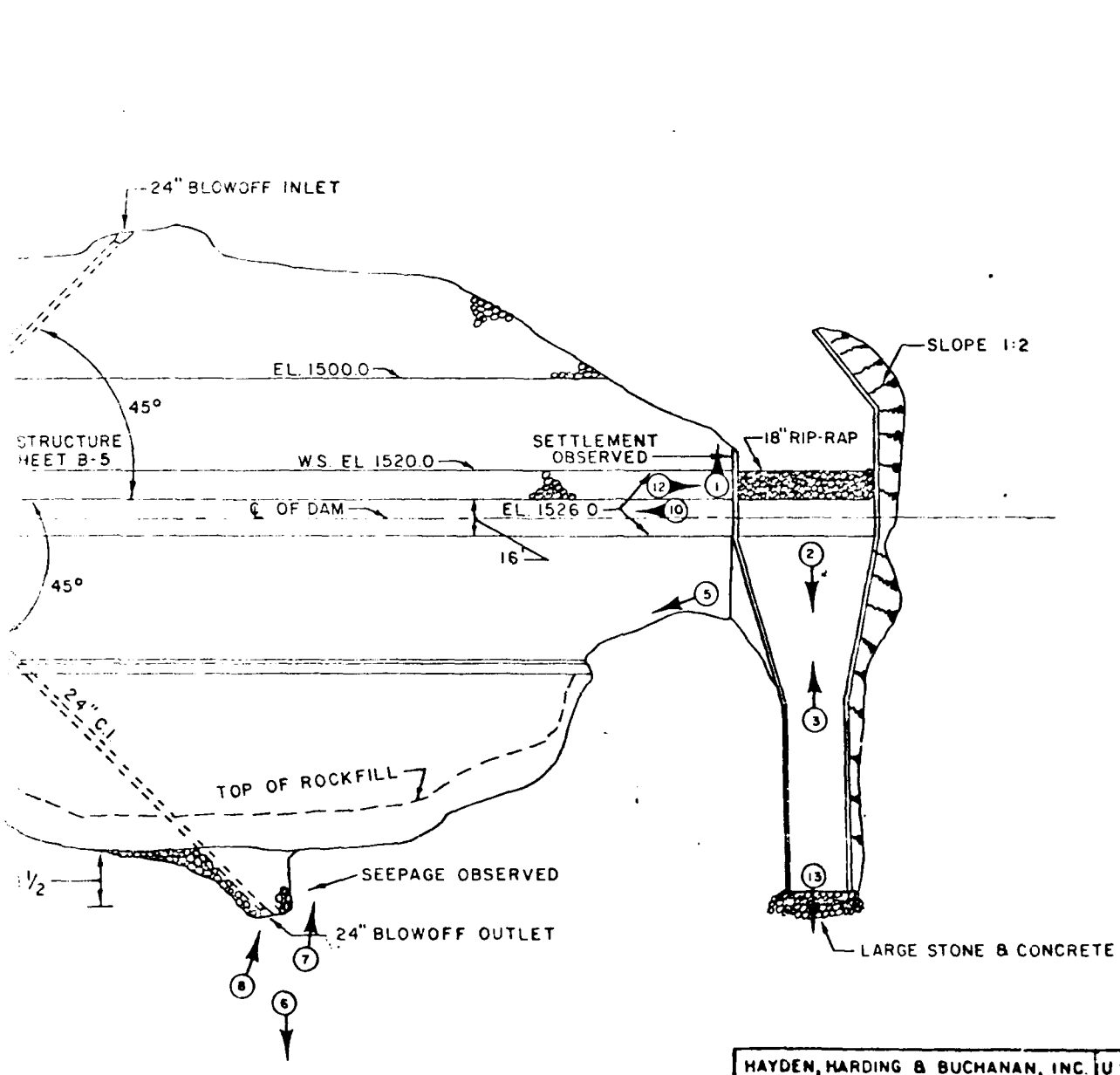
APPENDIX C

PHOTOGRAPHS



NOTE TAKEN FROM PLANS BY MEDCALF & EDDY DATED AUGUST 1946 ELEVATIONS SHOWN ARE NGVD

11/3



HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS			U.S. ARMY ENGINEER DI CORPS OF ENG. WALTHAM, M
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			DATE: AUGUST, 1981

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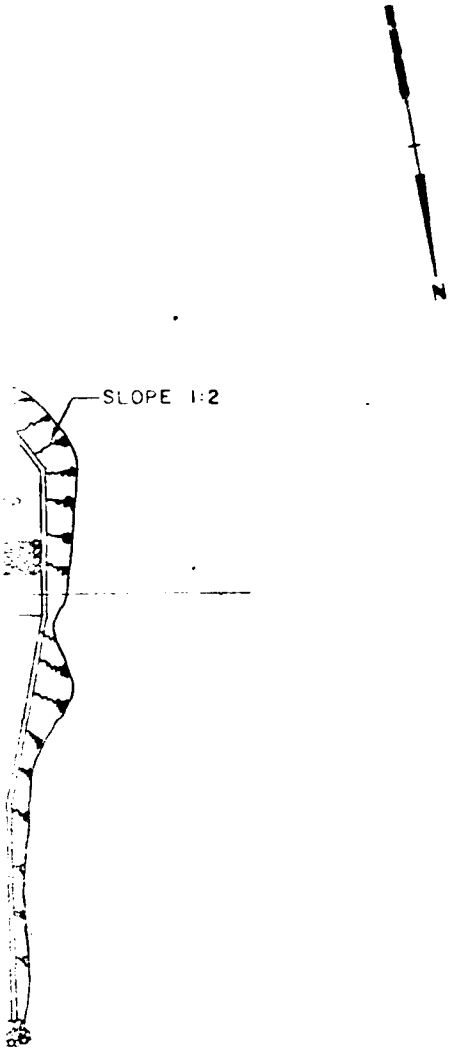

ARDING & BUCHANAN, INC. NSULTING ENGINEERS TON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

L PROGRAM OF INSPECTION OF NON-FED DAMS

UPPER SACKETT RESERVOIR DAM
PHOTO LOCATIONS

E MASSACHUSETTS

		SCALE: AS SHOWN
		DATE: AUGUST, 1981

AD-A154 482 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS 2/2
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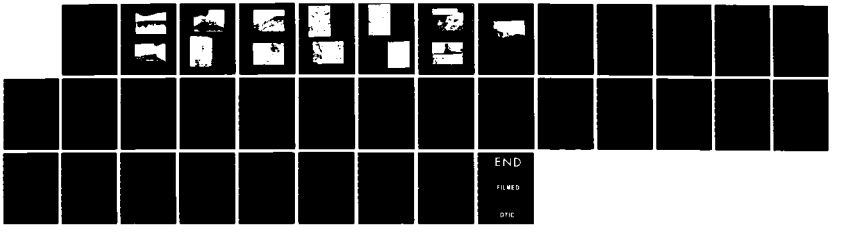
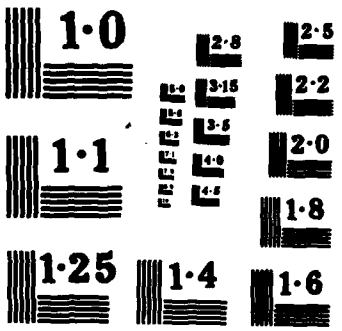
MA NEW ENGLAND DIV AUG 81

UNCLASSIFIED F/G 13/13 NL




1·0
1·1
1·25
1·4
1·6
1·8
2·0
2·2
2·5
2·8
3·15
3·5
4·0

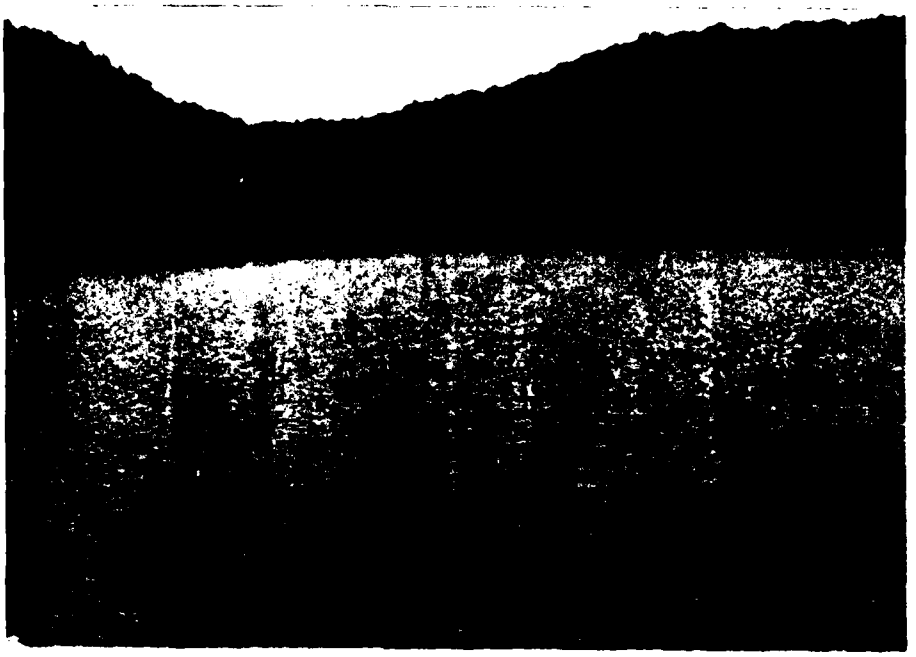


PHOTO NO. 1 - Upper Sackett Reservoir viewed from spillway crest.

PHOTO NO. 2 - Concrete spillway channel viewed from spillway weir.

PHOTO NO. 3 - View of spillway channel, wingwalls and weir.

PHOTO NO. 4 - Upstream riprap face and gate structure on right half of dam.

PHOTO NO. 5 - Downstream face and gate structure viewed from left side of dam embankment.

PHOTO NO. 6 - General view of outlet discharge channel.

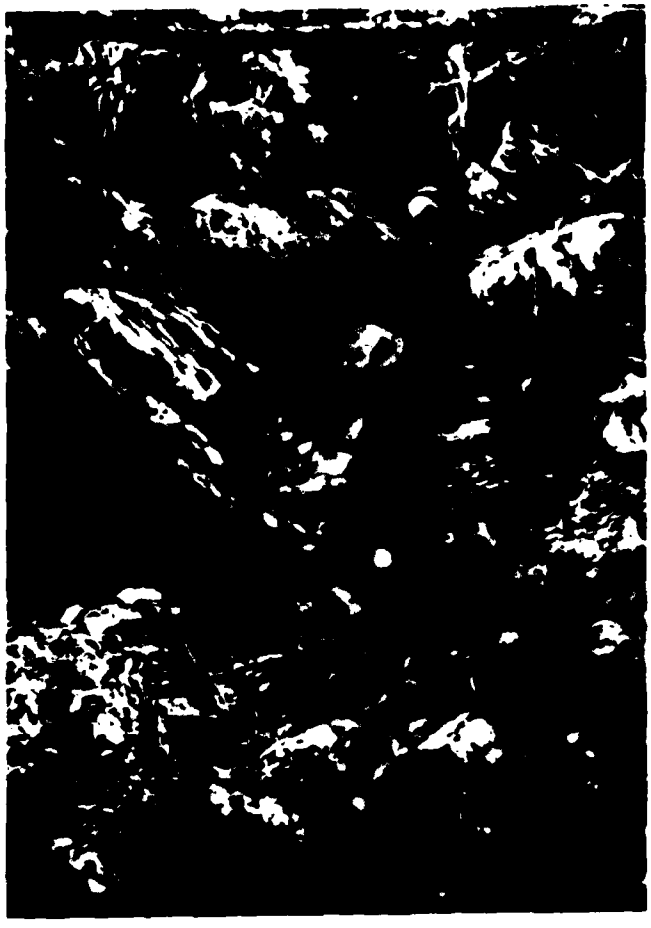


PHOTO NO. 7 - Seepage area on left side of outlet structure above outlet channel. About 3 to 5 gpm of clear flow.

PHOTO NO. 8 - Outlet structure at downstream toe.

EXPENSE

PHOTO NO. 9 - Seepage area at intersection of downstream toe and right abutment about 100 feet from right side of dam.

PHOTO NO. 10 - Crest of dam from spillway.

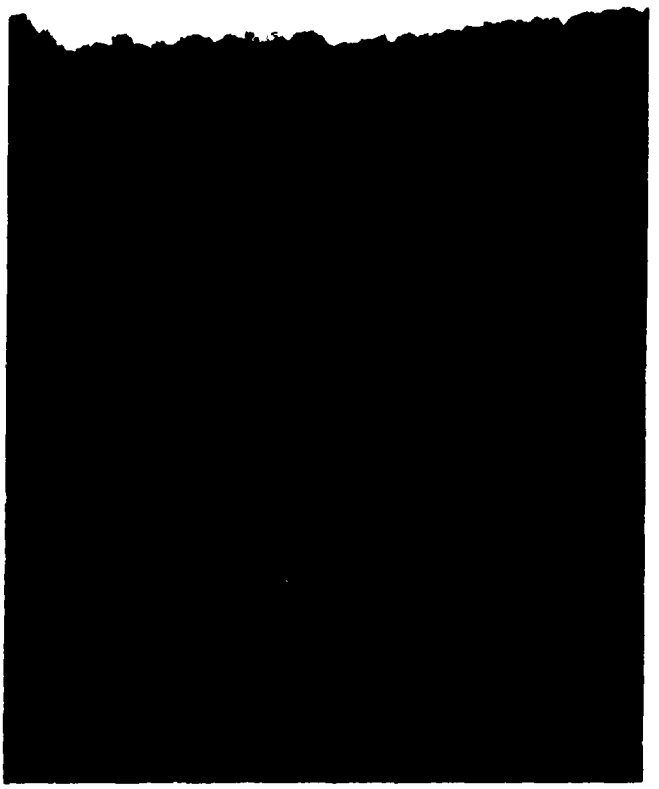


PHOTO NO. 11 - Base of gate structure where masonry finish on gate structure suggest that settlement of crest has occured. However, subsidence in this area not obvious.

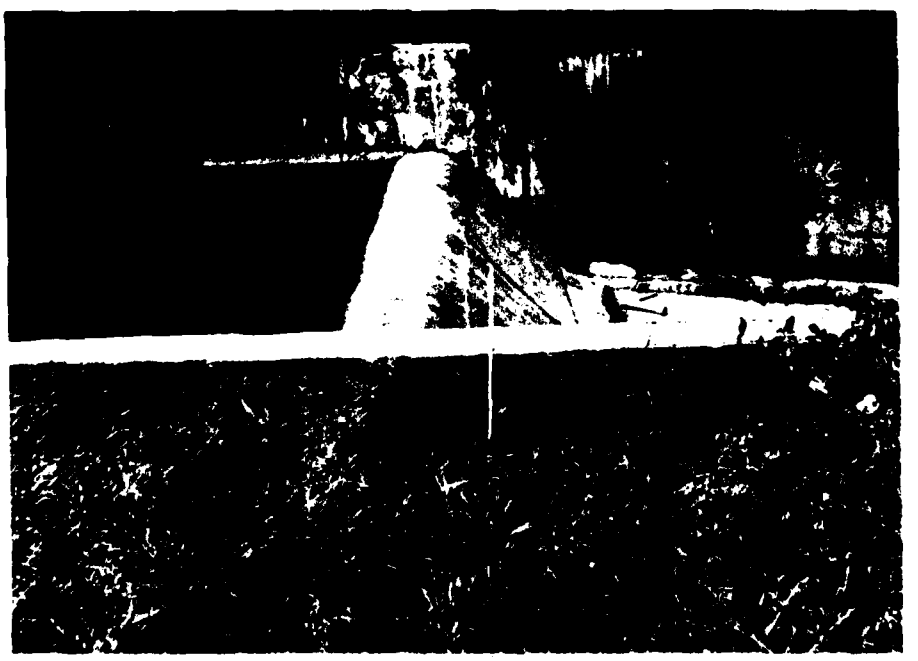


PHOTO NO. 12 - Spillway weir and settlement of crest up to 1 foot just behind right wall of spillway.

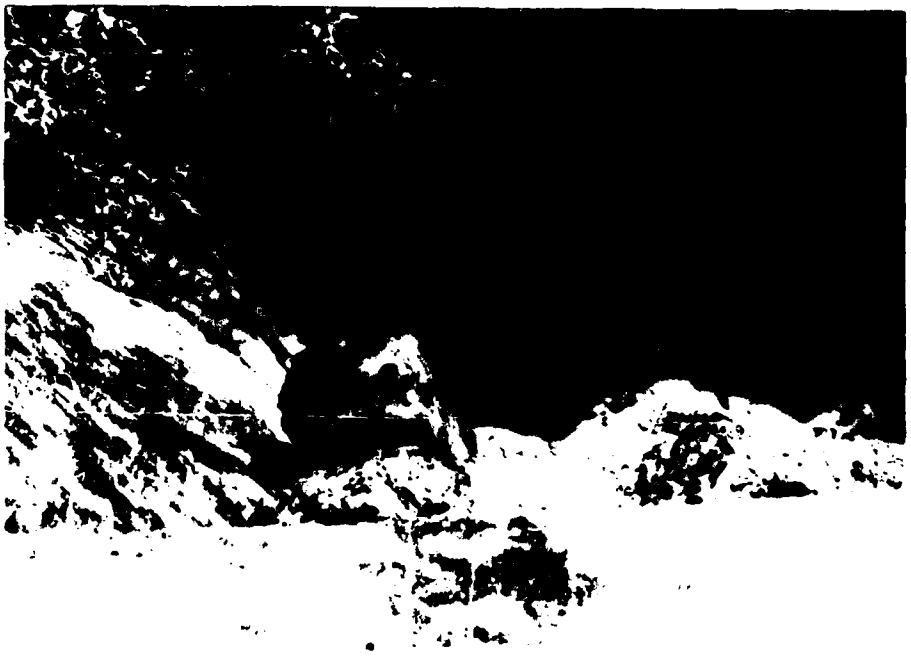


PHOTO NO. 13 - Spillway discharge channel downstream of chute.

JOB NO. 79.206.1001
DATE 4/4 3, 1981
BY MNA
CH'D BY S. Fabrizio

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-2
JOB Dams
SUBJECT Sackett Brook
CLIENT COE

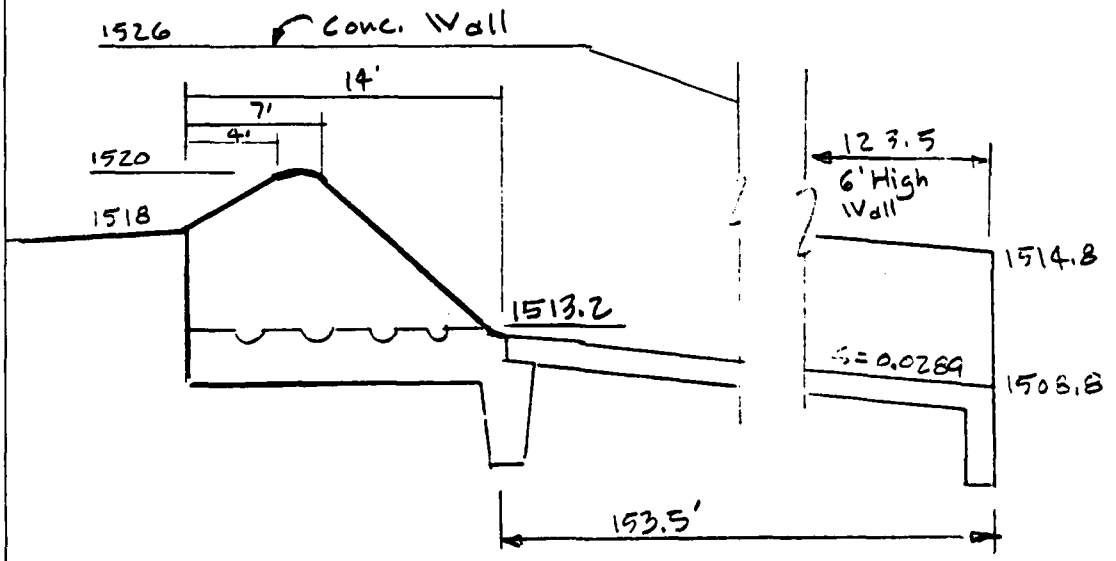
Stream : Sackett Brook
Drainage Area : 1 s.m. (640 acres)
Storage Capacity : 475. a-f (at elev 1520, spillway)
605 a-f (at elev 1526, Top of dam)

Drainage Area Character : Mountainous, steep very little development.

Test Flood Inflow : High hazard, Intermediate size use PMF

For 1 s.m. drainage area use 3000 cfs/sm (from COE) ∴ Inflow = 3000, cfs

Spillway & Outlet Channel



JOB NO. 79.206.1001
DATE 7-6-81
BY WA
CH'D BY J. Fe...

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-3
JOB Dams
SUBJECT Spillway
CLIENT COE

Test Flood Analysis

Hazard Potential: High, impact at least 30 homes, flood depths up to 6 ft.

Size Class: Storage 6050 a-f is small
height 75 ft is Intermediate
use Intermediate

For drainage areas of 1 s.m. use PMF = 3000 $\frac{cfs}{sm}$ (from COE)
Q_{P_1} = 3000 ± cfs.
D_1 = 5.6 ft at spillway

$Stor_1$ = 123 a-f (to elev 1525.6)

$\frac{123 \text{ a-f}}{1} \times \frac{1}{637 \text{ a}} \times \frac{12''}{f}$ = 2.32 inches runoff

$Q_{P_2} = 3000 \left(1 - \frac{2.32}{19}\right)$ = 2,634.± cfs

D_2 = 5.2 ft. $Stor_2$ = 114 a-f (2.15")

Stor ave = 2.24"

$Q_{P_3} = 3000 \left(1 - \frac{2.24''}{19''}\right)$ = 2646. cfs

Spillway Outflow is 2646.± cfs, at elev. 1525.3±, is 79% of total spillway capacity of 3350. cfs. Dam is not overtopped.

JOB NO. 79.206.1001
DATE July 3, 1981
BY N.A.
CH'D BY J. Francis

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-4
JOB Dams
SUBJECT Jackett Brook
CLIENT COE

Spillway Capacity $Q = cLH^{3/2}$

No provisions for flashboards

H	C	L	$H^{3/2}$	Q cfs	
0.5	3.1	60'	0.354	66. ✓	$c/c_v = 1.022$ $c_v = 3.72$
1.0	3.2		1.0	192. ✓	$c_d = 3.8$
2.0	3.36		2.83	570. ✓	
3.0	3.5		5.2	1092. ✓	
4.0	3.61		8	1733 ✓	
5.0	3.72		11.18	2495	
6.0	3.8	60'	14.7	3350± ✓	

Outlet Channel Capacity

At full depth

$$V = \frac{1.486}{.015}\left(\frac{153 sf}{37.5}\right)^{2.56\,2/3}(.0286)^{1/2} = 42.98 \text{ fps}$$

$Q = VA = 42.98(153) = 6576$ cfs > Spillway Capacity

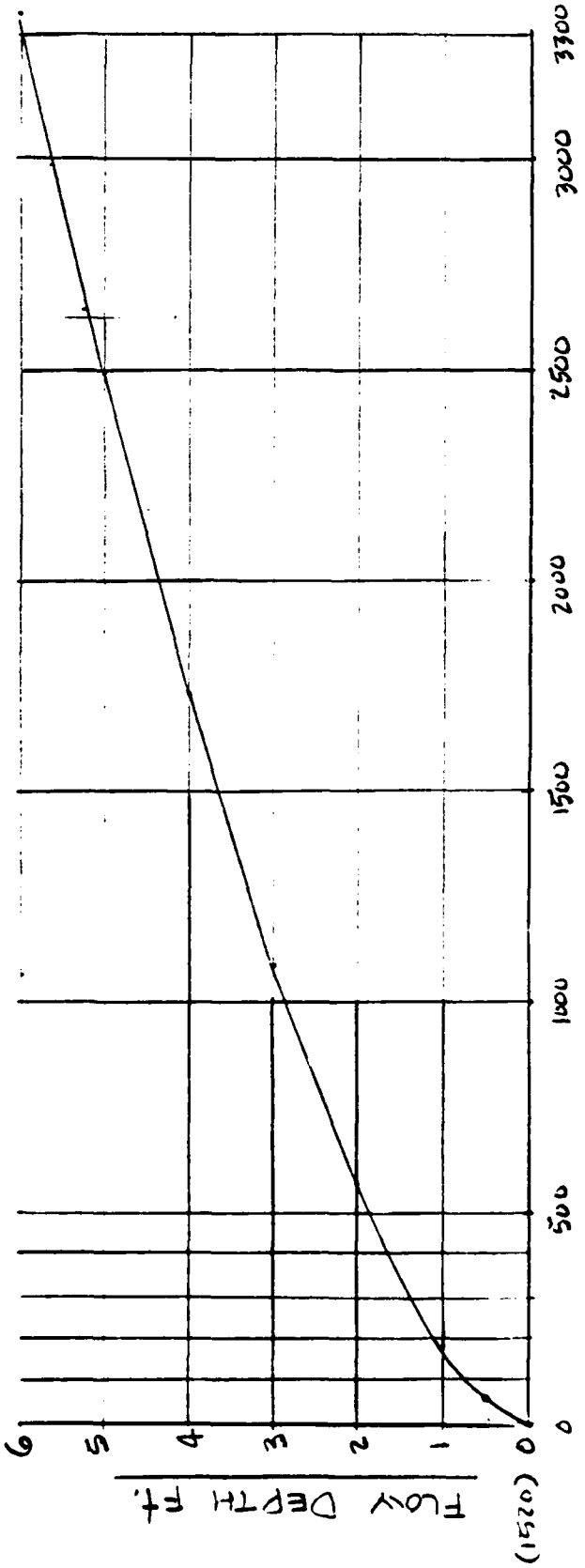
Surface Area - storage

elev.	Area	Vol.	
1520	20.9	0	
1526	22.40	130	a-f
1490 to 1520	155 m.g.	475	a-f

JOB NO. 79206.1001
DATE 7-6-81
BY WJA
CH'D BY

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D5
JOB Delaware
SUBJECT Pine Orchard
CLIENT COE



SPILLWAY CAPACITY, CFS

JOB NO. 79206.1001
DATE 7-6-81
BY WJA
CH'D BY

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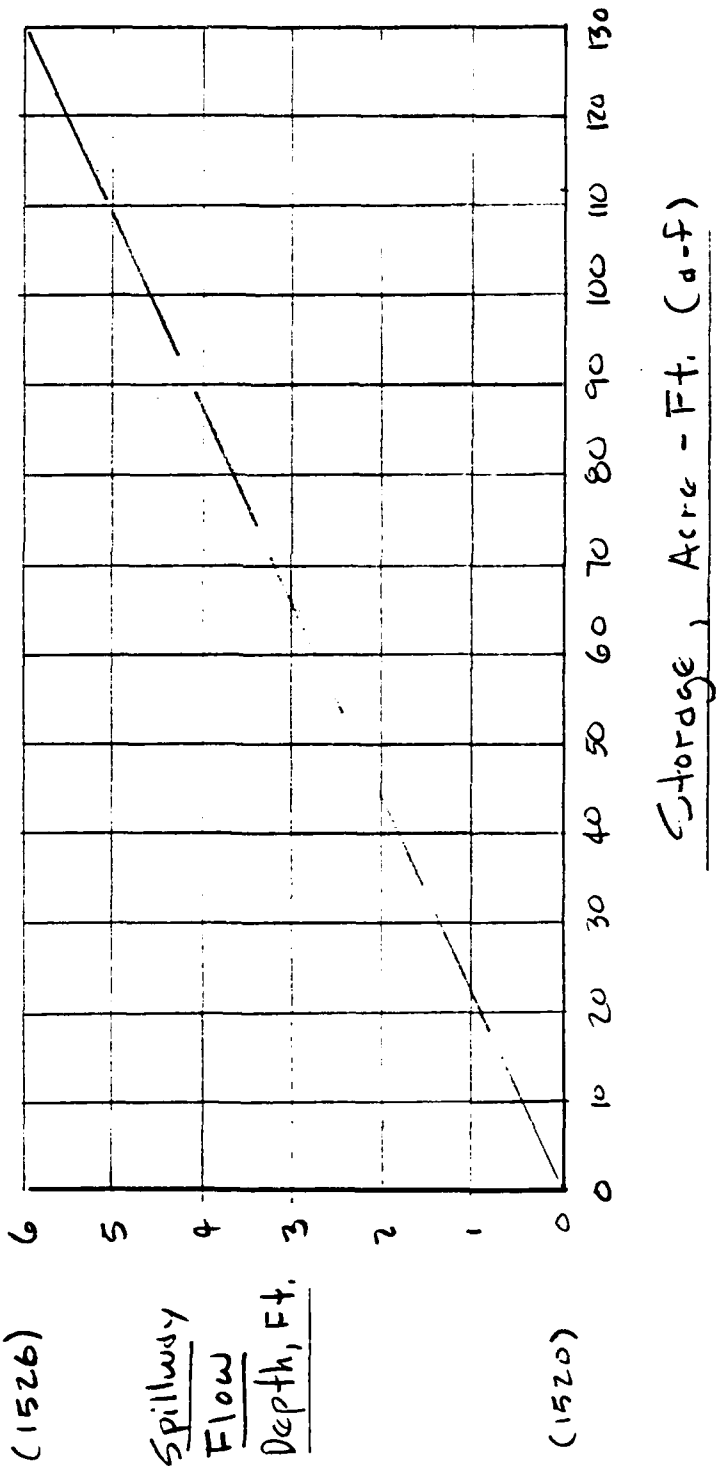
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-6
JOB Lams
SUBJECT Sackett Brk
CLIENT CCE



JOB NO. 79206.1001
DATE 7-9-81
BY MJA
CH'D BY J. Ferriss

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-7
JOB
SUBJECT
CLIENT

Dam Failure Analysis

Assume Dams Fails with water at top of dam, elev 1526., impoundment 605 a-f.

Hydraulic height = 1526 - 1450.5 = 75.5 ft.

Mid height Length = 380 ft.

Failure Outflow

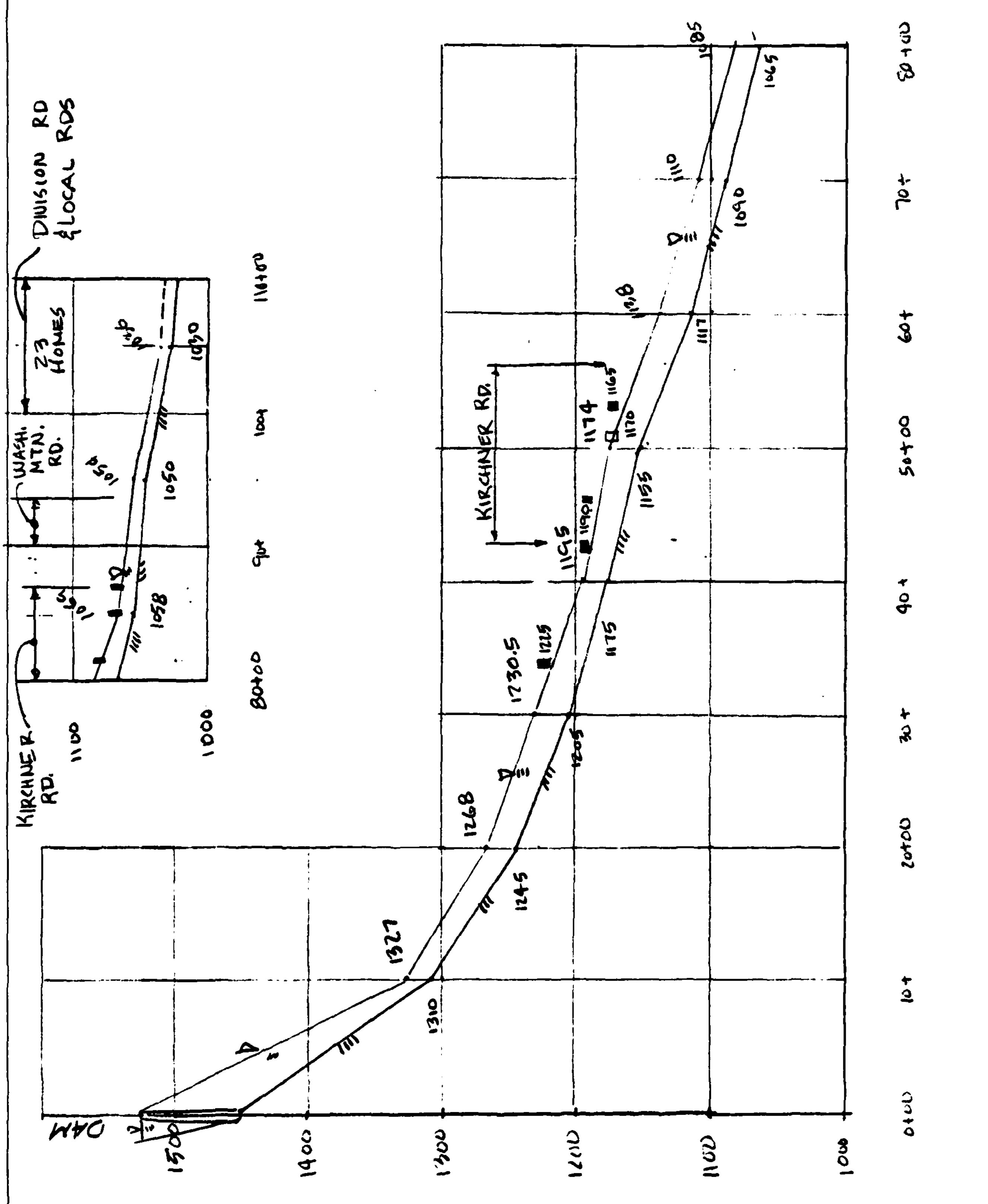
$$Q_F = \frac{8}{27} (0.4 \times 380) \sqrt{32.2} (75.5)^{1.5} = 167,656. \text{ cfs}$$

JOB NO. 79206.1001
DATE 7-9-81
BY MJA
CH'D BY J. Ferriss

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-3
JOB Dams
SUBJECT
CLIENT COE

DAM FAILURE FLOOD PROFILE



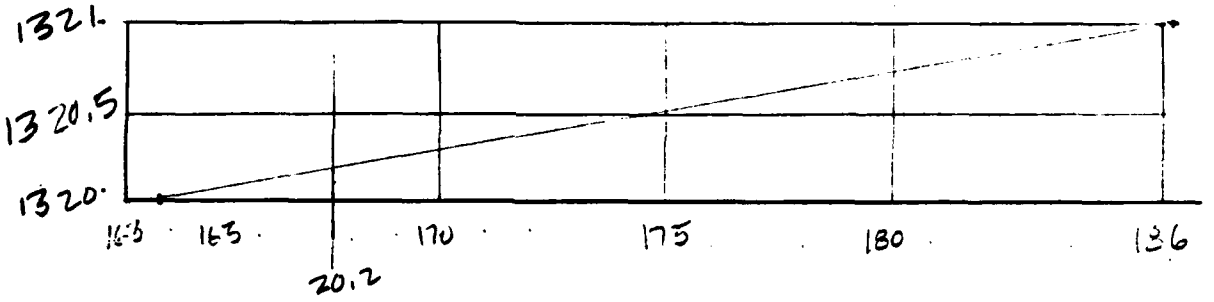
JOB NO. 79.206.1001
DATE 7-6-81
BY MVA
CH'D BY T. FERRISS

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-9
JOB DAMS
SUBJECT SACKETT BRK
CLIENT COE

Sta 10+00 $V = \frac{1.486}{n_{.010}} (R^{2/3})(S)^{1/2} = \text{"F"}\ R^{2/3}$ $S^{.130}$

D	WP	A	$R^{2/3}$	"F"	V	Q
10	250.	2125	4.19	5.36±	22.5 ✓	47,778. ✓
15	350	3625.	4.79	"	25.67 ✓	93,043. ✓
20	450	5625	5.43	"	29.11 ✓	163,763. ✓
21	460	6125	5.67	"	30.37	186,030. ✓



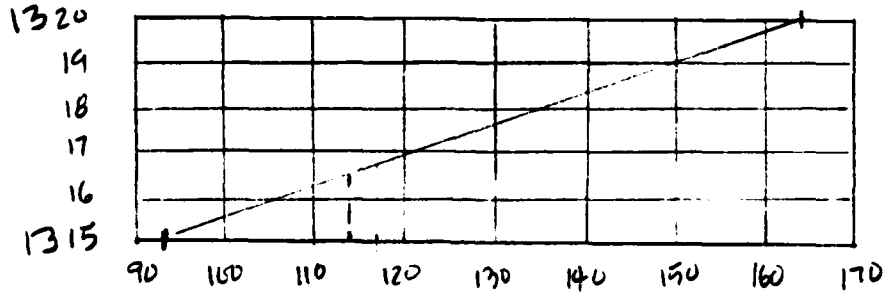
$Vol_1 = \frac{11250+5625}{2} \times \frac{1000}{43560} = 194$ ✓

$Vol_1 < \frac{605}{2}$

$Q_{P_1} = 167,656$ cfs $D_1 = 20.2$ ✓

$Q_{P_2} = 167,656. \left(1 - \frac{194 ✓}{605}\right) = 113,979.$ cfs

$D_2 = 16.5 \pm$ $Vol_2 = \frac{11250+3625}{2} \times \frac{1000}{43560} = 170$ ✓



$\frac{V_1+V_2}{2} = 183$ ✓

$Q_{P_3} = 167656 \left(1 - \frac{183}{605}\right) = 116,943.$ ✓ cfs $D_{1_3} = 16.1$ ✓

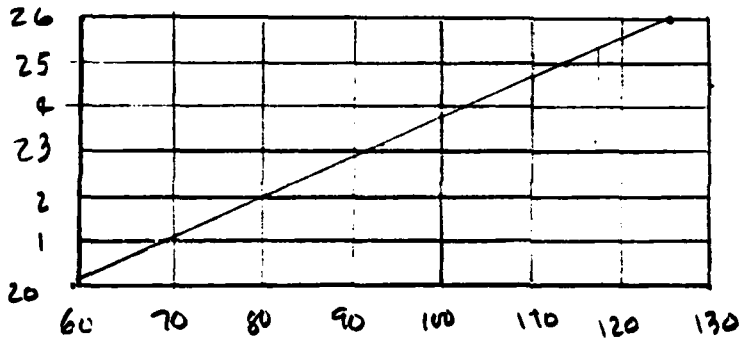
Elev = 1326.7

$A_3 = 4305$ ✓ sf

Sta 20+00

$V = \frac{1.486}{.110} (R^{2/3}) (.04)^{1/2} =$ "F" $R^{2/3} = 2.97\ R^{2/3}$

D	WP	A	$R^{2/3}$	"F"	V	Q
20	440	4350.	4.64	2.97	13.8	59,968.
25	510	6750.	5.64	"	16.8	113,400.
26	520	7240	5.83	"	17.3	125,544.



$Q_{P_1} = 116{,}943^{\pm}$ cfs $\quad D_1 = 25.4\pm$

$Q_{P_2} = 116943 \left(1 - \frac{129}{605}\right) = 92{,}008.$ $\quad Vol_1 = \frac{4305+6946}{2}\left(\frac{1000}{43560}\right) = 12^{\pm}$

$D_2 = 23$ $\quad Vol_2 = \frac{4305+5790}{2}(\quad) = 116\pm$

$Vave = \frac{116+129}{2} = 123\pm$

$Q_{P_3} = 116{,}943.\left(1 - \frac{123}{605}\right) = 93{,}168.$

$D_3 = 23.20$ $\quad A = 5{,}886.$ sf.

Elev = 1268.2

JOB NO. 79.206.1001
DATE 7-6-81
BY MJA
CH'D BY J. Ferris

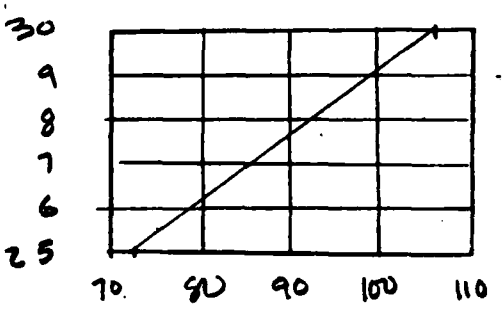
HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. [illegible]
JOB Dams
SUBJECT Stellata
CLIENT COE

Sta 30+00

$V = \frac{1.486}{.1} R^{2/3} (.04)^{1/2} = 2.97 R^{2/3}$

D	WP	A	$R^{2/3}$	"F"	V	Q
25	230	3760	6.5	2.97	8.3	72604.
30	265	5010	7.17	"	21.28	106,637.
35	305	6000	7.36	"	21.9	131,155.



$Q_{P_1} = 93,168.$ cfs $D_1 = 28.2$ $Vd_1 = \frac{5886+4360}{2}\left(\frac{1000}{43500}\right) = 120$ a-f

$Q_{P_2} = 93168\left(1 - \frac{120}{605}\right) = 74,688.$ $D_2 = 25.4$

$Vol_2 = \frac{5886+3860}{2}(\quad) = 112$ $V_{ave} = 116$ a-f

$Q_{P_3} = 93168\left(1 - \frac{116}{605}\right) = 75,304$ cfs $D_3 = 25.5$

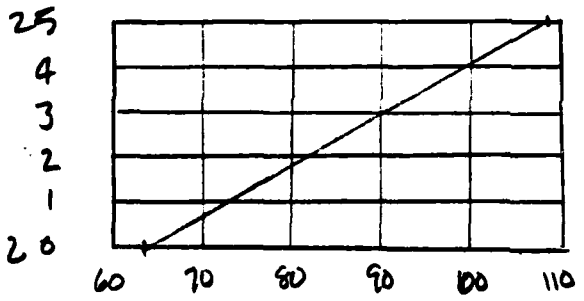
$A = 3860$

Elev. = 1230.5

Sta 40+00

$V = \frac{1.486}{0.10} (R^{2/3}) (.028)^{1/2} = R^{2/3} (2.49)$

D	WP	A	$R^{2/3}$	2.49 ·	V	Q
			1.81		4.5	
5	200	310	1.34	"	3.34	1035
20	400	4800	5.28	"	13.2	63,167.
25	440	6900	6.32	"	15.74	108,633.



for base flow of 3000 cfs d ≈ 8' or elev. 1183 no damage

$Q_{P_1} = 75,304.$ cfs $D_1 = 21.15$ $Vol_1 = \frac{3860+5283}{2}\left(\frac{100}{7}=60\right)$

Vd = 105 a-f

$Q_{P_2} = 75304\left(1 - \frac{105}{605}\right) = 62,235.$ $D_2 = 19.9$

$Vol_2 = \frac{3860+4750}{2}(\quad) = 99$ $Vol_a = 102$ a-f.

$Q_{P_3} = 75,304.\left(1 - \frac{102}{605}\right) = 62,608.$ ± cfs

$D_3 = 19.9$ $A = 4750$ s.f.

Elev = 1194.9

JOB NO. 79206.1001
DATE 7-7-81
BY MJA
CH'D BY JFEXPISS

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

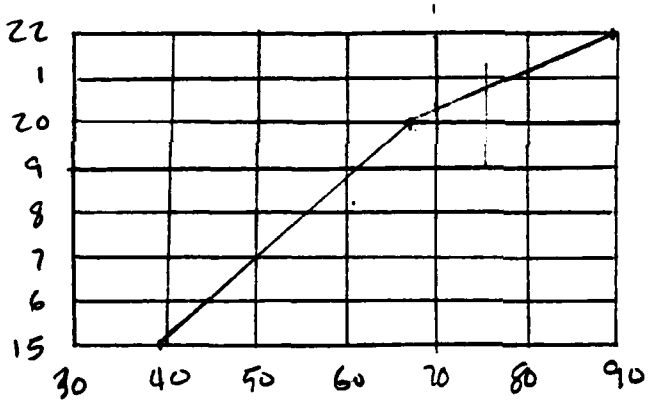
SHEET NO. D-13
JOB Dams
SUBJECT Sackett
CLIENT COE

75304 (4750)

Sta 50+00

$$V = \frac{1.486}{0.10}(R^{2/3})(0.038)^{1/2} = R^{2/3}(2.90)$$

D	WP	A	$R^{2/3}$	2.90 ·	V	Q
22	540	6100	5.08	2.9	14.71 ·	89783. ·
20	520	5040	4.58	"	13.28 ·	66,948. ·
15	400	3300	4.11	"	11.92 ·	39,349. ·



$Q_{P_1} = 75304$ $D_1 = 20.8$ $V_1 = \frac{4750+5464}{2}(.0229568) = 11$

$Q_{P_2} = 75304\left(1 - \frac{117}{605}\right) = 60,711.$ cfs $D_2 = 19.0$

$V_2 = \frac{4750+4692}{2}(\ ) = 108 \cdot$ $V_{ave} = 113.$

$Q_{P_3} = 75304\left(1 - \frac{113}{605}\right) = 61,239.$ $D_3 = 19.1$

$a = 4740.$

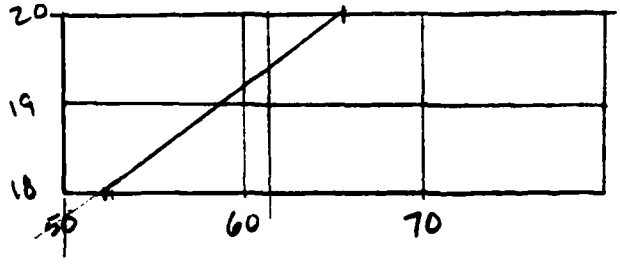
Elev = 1174.1

Sta 60+00

$Q_{P1} = 61239$

$$V = \frac{1.486}{0.1} R^{2/3} (.025)^{1/2} = 2.35 R^{2/3}$$

D	WP	A	$R^{2/3}$	2.35	V	Q
10^{+3}	250	1900	3.89	"	9.1 ✓	17376. ✓
18^{+3}	320	4050	5.97	"	12.9 ✓	52,128. ✓
20^{+3}	330	4700	5.93	"	13.9 ✓	65,473. ✓



$Q_{P_1} = 61,239.$ $D = 19.4$ $V = \frac{4740 + 4510}{2}\left(\frac{1000}{43560}\right) = 106.$ ✓

$Q_{P_2} = 61239\left(1 - \frac{106}{605}\right) = 50,492.$ cfs $D = 17.7$

$V_2 = \frac{4740 + 3950}{2}\left(\frac{1000}{43560}\right) = 100$ ✓ $V_{ave} = 103$ ✓

$Q_{P_3} = 61239\left(1 - \frac{103}{605}\right) = 50,813.$ cfs $D = 17.8$

Elev = 1137.8

JOB NO. 7°,206.1D01
DATE 7-9-81
BY MJA
CH'D BY —

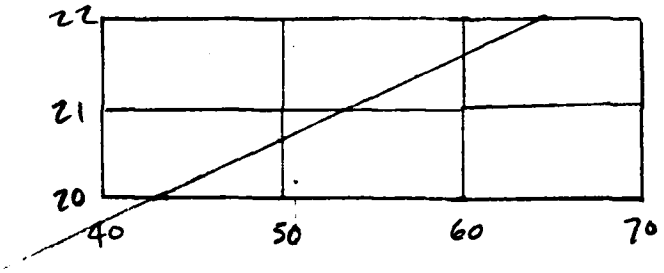
HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-15
JOB Dams
SUBJECT Spillway
CLIENT COE

Sta 70+00

$$V = \frac{1.486}{0.1} R^{2/3} (.028)^{1/2} = R^{2/3} (2.49)$$

D	WP	A	$R^{2/3}$	2.49	V	Q
			4.93			
20	320.	3500.	4.67	"	12.27	43,000.
25	350	5140.	6.05	"	15 ✓	77,443 ✓
22	330	4490	5.75	"	14.31 ✓	64275. ✓



$Q_{P_1} = 50,813.$ cfs $D = 20.7$ $V_1 = \frac{4000+4341}{2}\left(\frac{1000}{935\omega}\right) = 91$

$Q_{P_2} = 50,813.\left(1 - \frac{96}{605}\right) = 42,750.$ ✓ $D_2 = 19.1$

$V_2 = \frac{4000+3870}{2}(\quad) = 86$ ✓ $V_{ave} = 91$ ✓

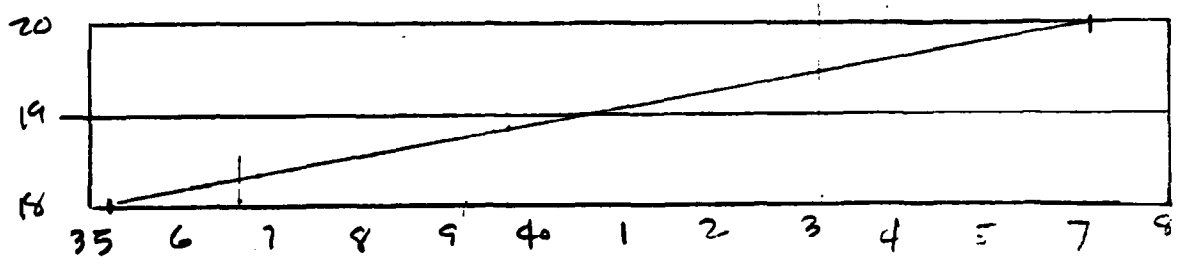
$Q_{P_3} = 50813\left(1 - \frac{91}{605}\right) = 43,170.$ ✓

ELEV. 1110.0

Sta 80+00

$V = \frac{1.486}{0.10} (R^{2/3})(0.016)^{1/2} = R^{2/3}\ 1.88$

D	WP	A	$R^{2/3}$	$R^{2/3}$ 1.88	V	Q
18	400	4000.	4.68	"	8.8	35,200.
20	410.	4410.	5.21	"	9.8	47,113.



$Q_{P_1} = 43,170$, $D = 19.4$, $V_d = \frac{3400+4567}{2}\left(\frac{1000}{43560}\right) = 91$

$Q_{P_2} = 43157\left(1 - \frac{91}{605}\right) = 36,666.$

$D_2 = 18.3$, $V_2 = \frac{3400+4120}{2}(\quad) = 86$, $V_a = 88$

$Q_{P_3} = 43157\left(1 - \frac{88}{605}\right) = 36,880.$, $D = 18.40$

Elev. = 1085.40

JOB NO. 79206.1001
DATE 7-9-81
BY MJA
CH'D BY JCFerriss

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

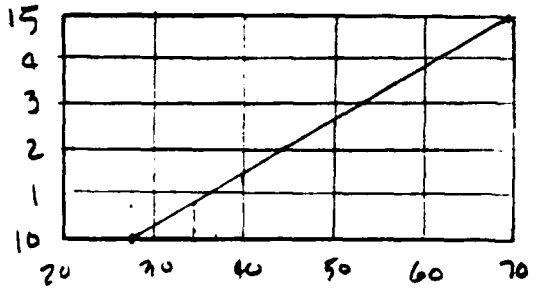
SHEET NO. D-17
JOB Dams
SUBJECT Sackett
CLIENT COE

39662

Sta 85+00

$$V = \frac{1.4860}{0.05} R^{2/3} (0.012)^{1/2} = R^{2/3}\ 3.25$$

D	WP	A	$R^{2/3}$	3.25	V	Q
10	425	2540	3.31	"	10.76	27,348.
15	580	5040	4.26	"	13.84	69,734.



$Q_{P_1} = 36,880.$ ± $D_1 = 11.0$ $Vol_1 = \frac{4120+3040}{2}\left(\frac{5.0}{43.0}\right) = 41$

$Q_{P_2} = 36,880.\left(-\frac{41}{605}\right) = 34,375$ $D_2 = 10.8$

$V_2 = \frac{4120+2955}{2}(\ ) = 41.$ $V_a = 41$

$Q_{P_3} = 34,375$ Elev. = 1069.

JOB NO. 79206.1001
DATE 7-10-81
BY MJA
CH'D BY J. FERRISS

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

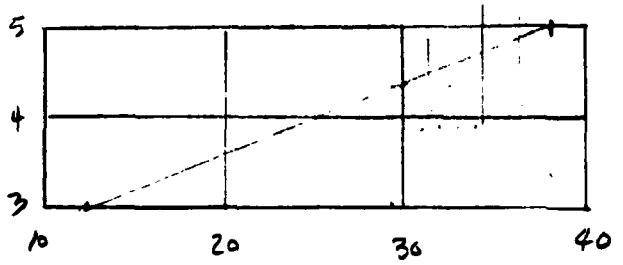
SHEET NO. D-19
JOB Dams
SUBJECT Sackett
CLIENT CoE

Std 95+00

36 C 43

$V = \frac{1.486}{0.05} (R^{2/3})(0.015)^{1/2} = R^{2/3}(3.64)$

D	WP	A	$R^{2/3}$	3.64	V	Q
5	1250	4500	2.36	"	8.59	38,640.
3	1100	2150	1.57	"	5.70	12,261.



$Q_{P_1} = 34,375.$ $D_1 = 4.8'$ $Vol_1 = \frac{2977 + 4400}{2}\left(\frac{1000}{43560}\right) = 85$

$Q_{R_2} = 34375\left(1 - \frac{85}{605}\right) = 29,545$

$D_2 = 4.3$ $Vol_2 = \frac{2977 + 3689}{2}(\quad) = 76$ $V_a = 80$

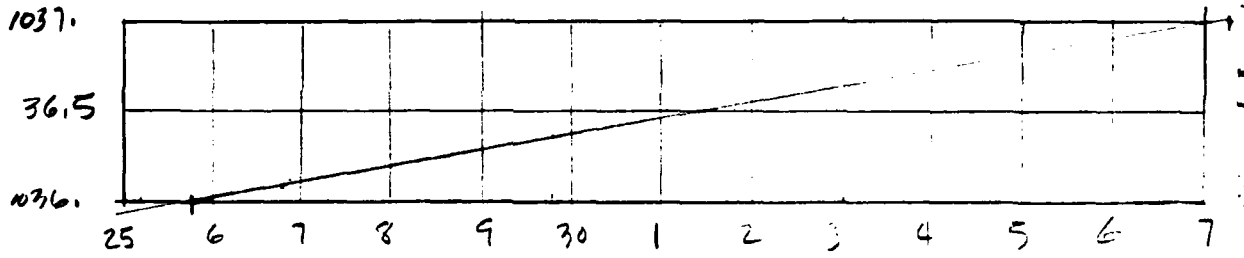
$Q_{P_3} = 34375\left(1 - \frac{80}{605}\right) = 29,829.$ $D = 4.4$

Elev = 1054.4

Sta 105+00

$$V = \frac{1.486}{.07} R^{2/3} (0.015)^{1/2} = R^{2/3} (2.6)$$

D	WP	A	$R^{2/3}$	(2.6)	V	Q	
1'	1000	1000	1.00		2.6	2600	base flow
1036	1030	4020	2.48	2.6	6.45	25,811.	Flood depth 1' minor Flooding
1037	1080	5080	2.82	"	7.34	37,271.	damage - roads basements



$Q_{P_1} = 29,829.$ $D_1 = 1036.45$ $Vol_1 = \frac{3700 + 4480}{2}\left(\frac{1000}{43560}\right) = 94.$

$Q_{P_2} = 29,829\left(1 - \frac{94}{605}\right) = 25,194.$ $D_2 = 1035.95$

$Vol_2 = \frac{3700 + 3900}{2}(\quad) = 87$ $V_{ave} = 91$

$Q_{P_3} = 29,829\left(1 - \frac{91}{602}\right) = 25,342$

Elev = 1036.00

JOB NO. 79206.1001
DATE 7-6-31
BY MJA
CH'D BY

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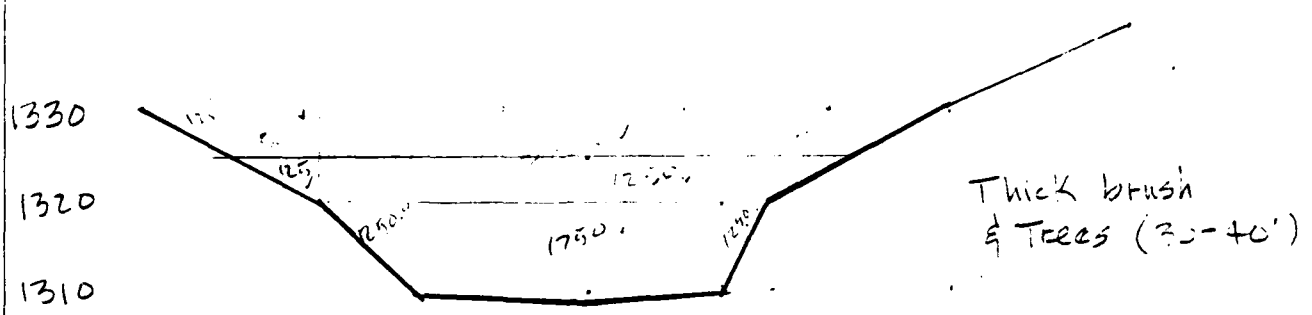
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. J-20
JOB Dams
SUBJECT Sackett Brk
CLIENT COE

Sta 10+00

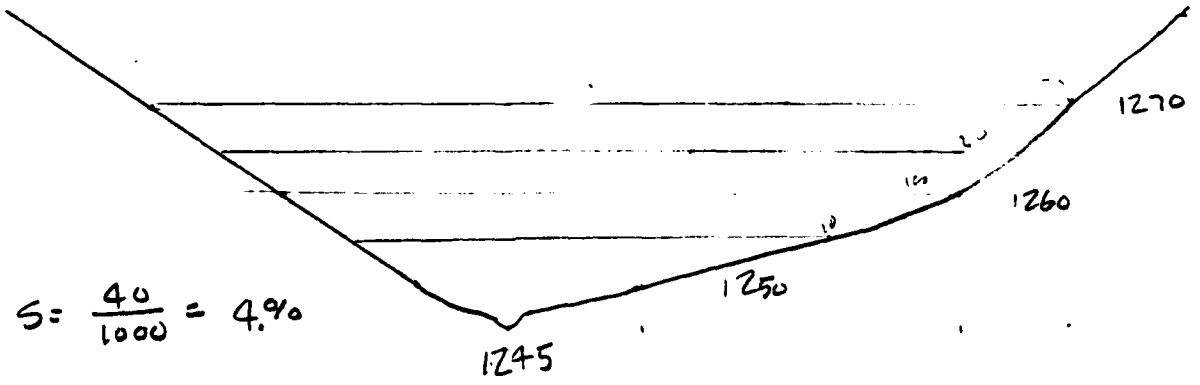
20 ↑ → 100



$S = \frac{130}{1000} = 13.0\%$

Sta 20+00

20 ↑ → 100



$S = \frac{40}{1000} = 4.0\%$

JOB NO. 79.206.1001
DATE 7-6-81
BY MJA
CH'D BY

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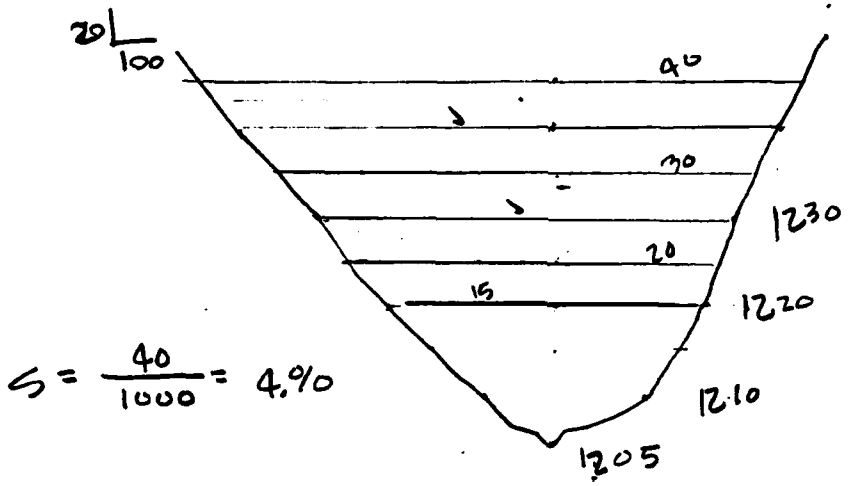
BOSTON — WEST HARTFORD

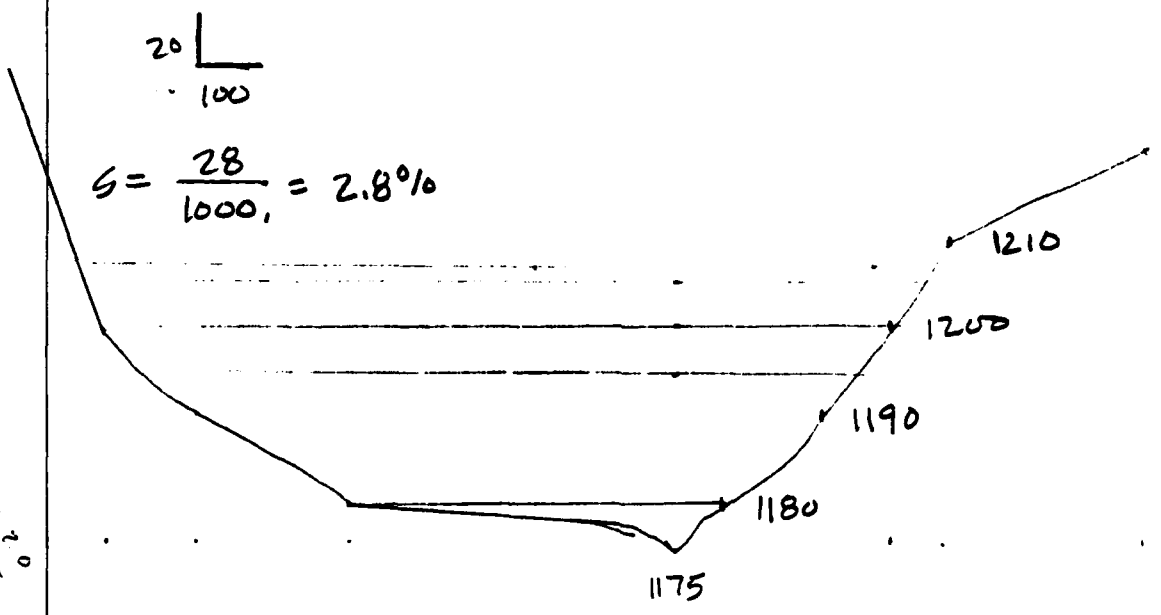
SHEET NO. D-21
JOB Dams
SUBJECT Sackett
CLIENT COE

Sta 30+00



$S = \frac{40}{1000} = 4.0\%$

Sta 40+00



$S = \frac{28}{1000} = 2.8\%$

JOB NO. 79.7 M.100
DATE 7-7-81
BY MJA
CH'D BY

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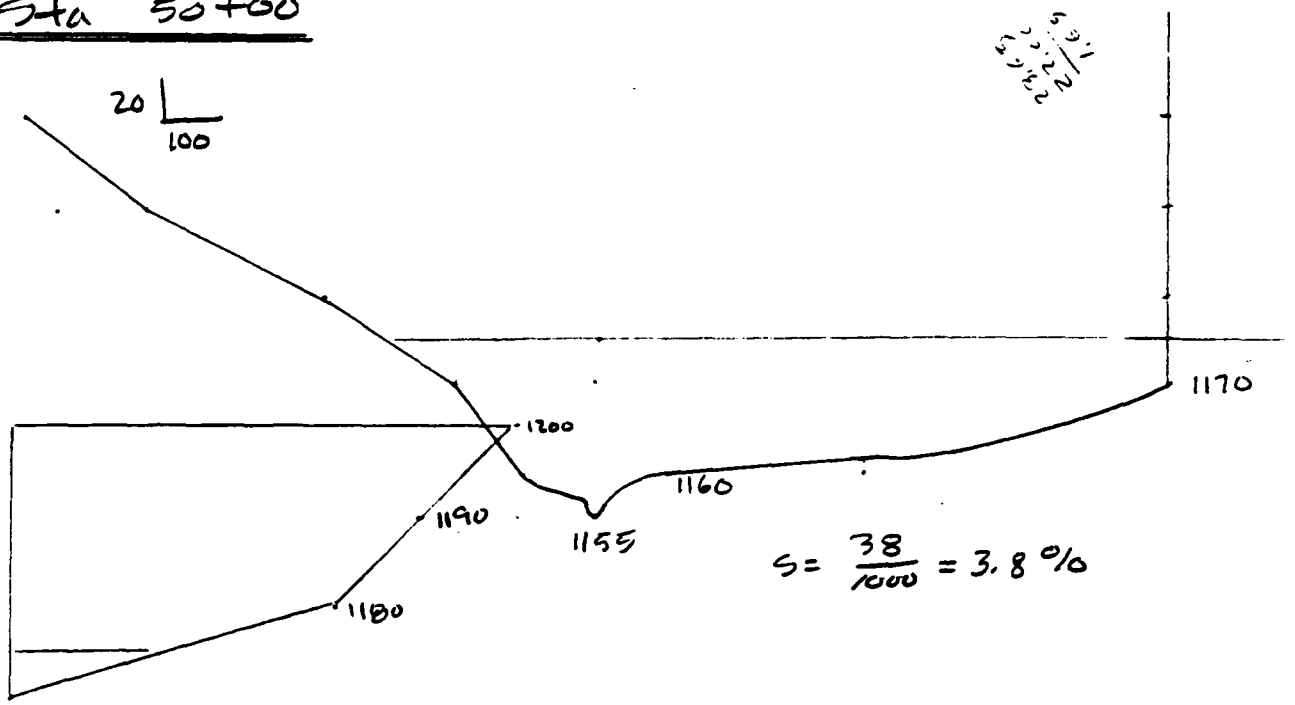
BOSTON — WEST HARTFORD

SHEET NO. D-22
JOB Dam
SUBJECT Sta 50+00
CLIENT COE

Sta 50+00



JOB NO. 79206.1001
DATE 7-7-81
BY MJA
CH'D BY

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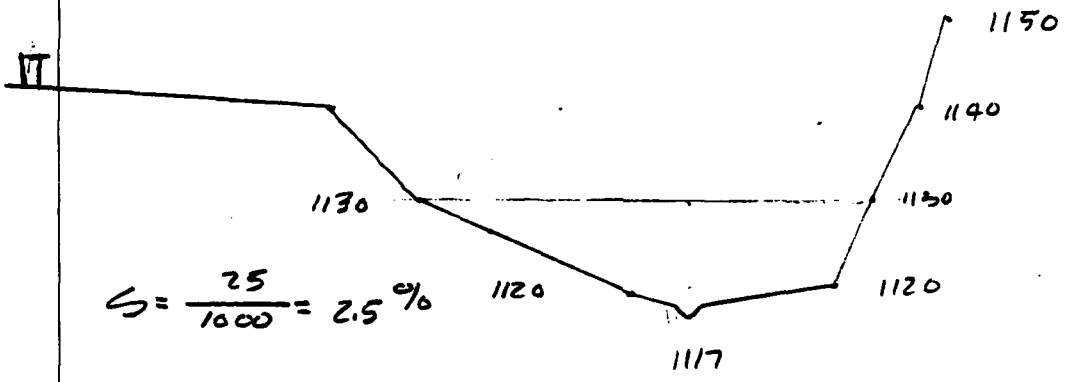
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-23
JOB DAMS
SUBJECT JACKET
CLIENT COE

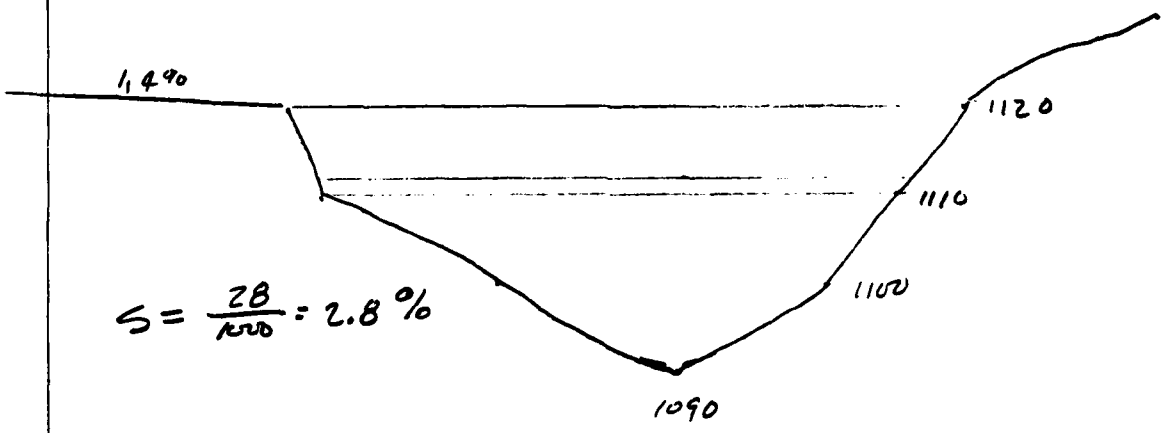
Sta 60+00

20 L/100



$S = \frac{25}{1000} = 2.5\%$

Sta 70+00



$S = \frac{28}{1000} = 2.8\%$

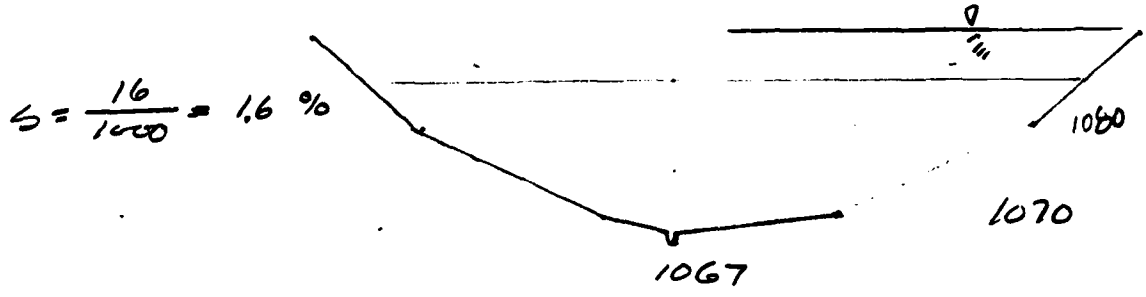
JOB NO. 79206
DATE 7-9-81
BY MJH
CH'D BY

HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. 2-24
JOB Dam
SUBJECT Backup
CLIENT CDE

Sta 80+00

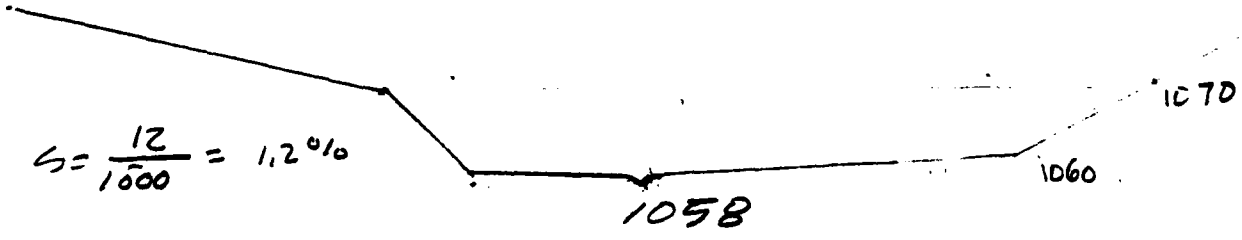
20 | 100



$S = \frac{16}{1000} = 1.6\ \%$

Sta 85+00

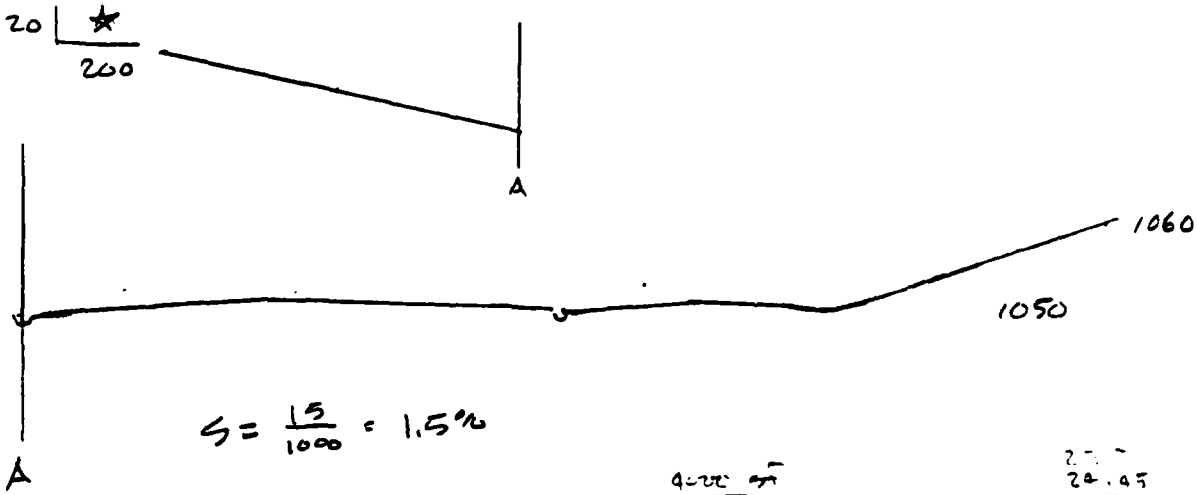
20 | 100



$S = \frac{12}{1000} = 1.2\%$

Sta 95+00

20 | ★ 200



$S = \frac{15}{1000} = 1.5\%$

Same as 1 main.

24.05

JOB NO. 79206.1601
DATE 7-10-81
BY WJA
CH'D BY

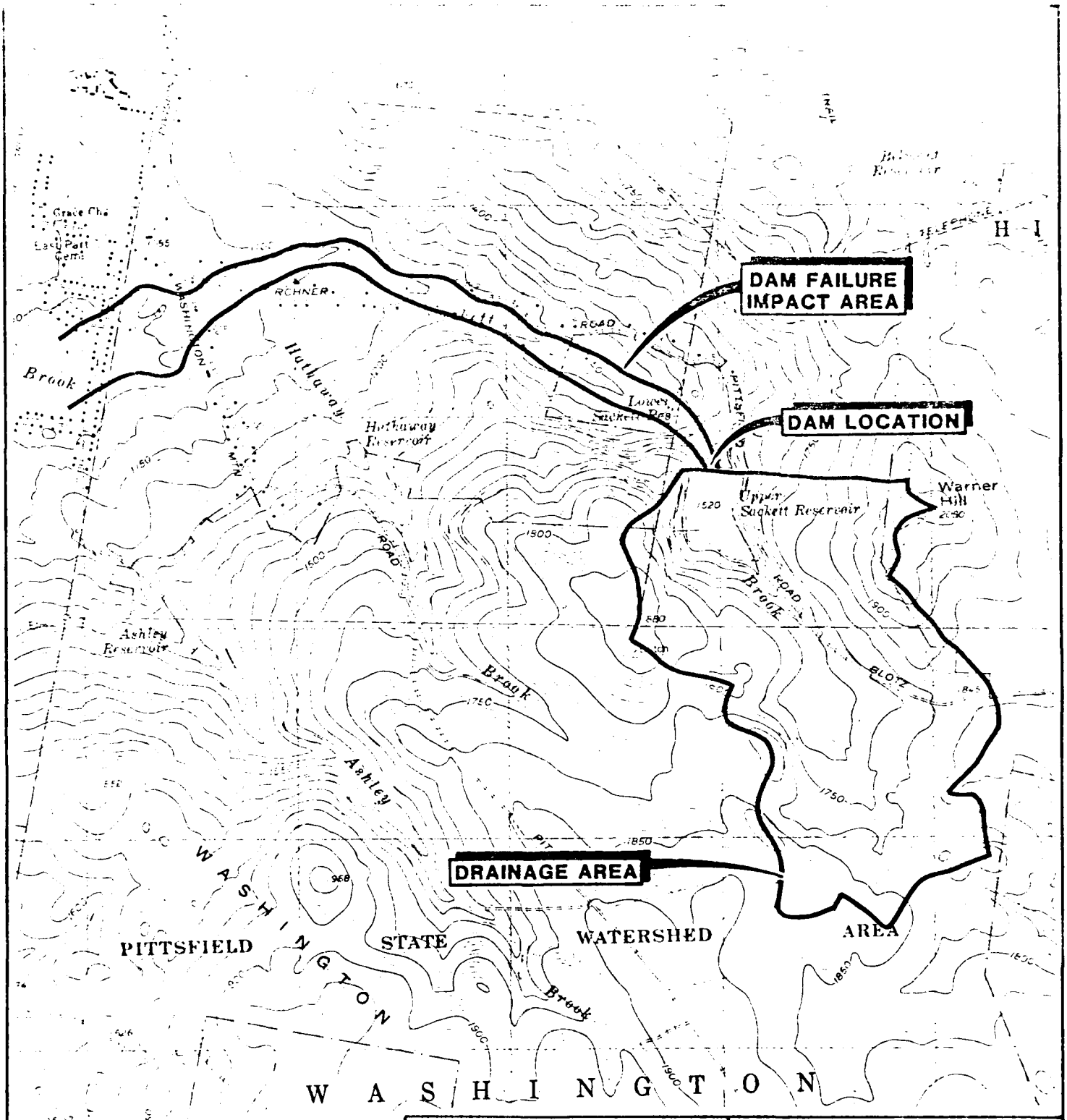
HH&B HAYDEN, HARDING & BUCHANAN, INC.
CONSULTING ENGINEERS
BOSTON — WEST HARTFORD

SHEET NO. D-15
JOB Drum
SUBJECT Backup
CLIENT COE

Sta 105+00

$20 \frac{*}{200}$

$S = 1.5\%$



HAYDEN, HARDING & BUCHANAN, INC. CONSULTING ENGINEERS BOSTON, MASSACHUSETTS	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

UPPER SACKETT RESERVOIR DAM

DAM FAILURE IMPACT & DRAINAGE AREAS

HINSDALE MASSACHUSETTS

SCALE: 1:25000

DATE: AUGUST, 1981

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

NOT AVAILABLE AT THIS TIME

END

FILMED

6-85

DTIC